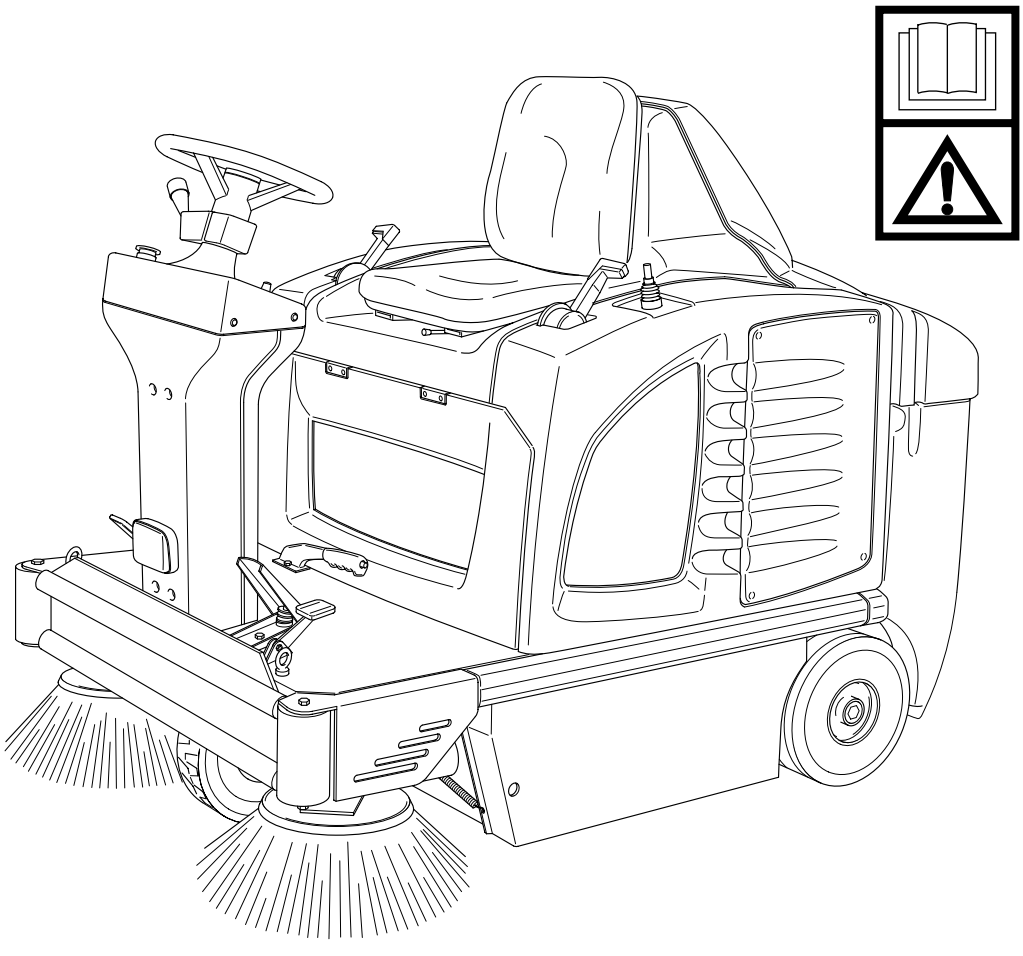
SR **1300 B/ECO**



OPERATOR MANUAL

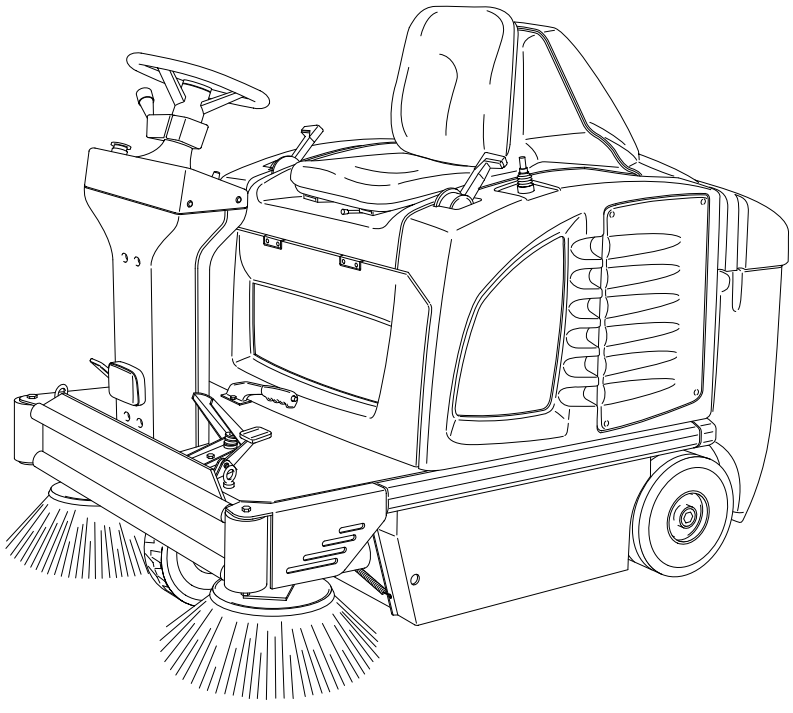
Advance MODELS 908 3013 010, 908 3301 010

Nilfisk Advance

setting standards

FORM No. 56041481(1)00-03

INDEX



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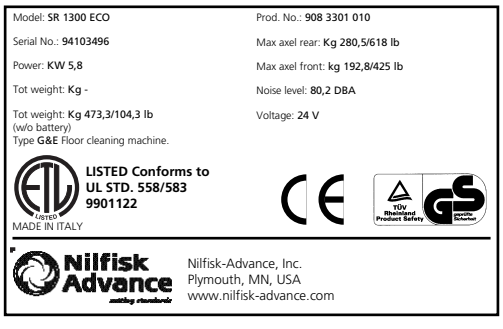
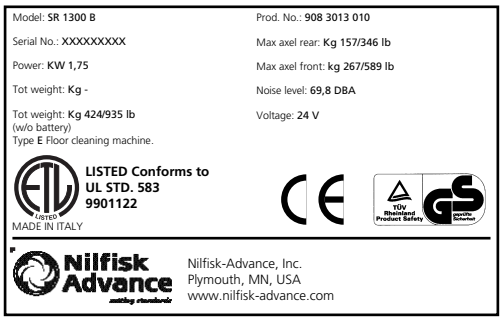
INTRODUCTION / GENERAL INFORMATION

INTRODUCTION
This manual will help you get the most from your Sweeper Advance.
Any "left" or "right" indications are always defined with reference to the machine forward movement direction. He has the skilled personnel, the original parts and the tools needed to meet your requirements. The machine should not be used without protection devices.
For your safety, make sure that all the safety guards are closed or mounted correctly before stating up the machine.

PARTS AND SERVICE
Repairs, when required should be performed by your Authorized Advance Service Center, who employs factory trained service personnell, and maintains an inventory of Advance original replacement parts and accessories.
Call the Advance Dealer named below for repair parts or service.
Please specify the Model and the Serial Number when discussing your machine.

NAME PLATE
The Model Number and the Serial Number of your machine are shown on the Nameplate on the machine. This information is needed when ordering repair parts for the machine. Use the space below to note the Model and Serial Number of your machine for future reference.





GENERAL SAFETY RULES
Carefully follow the rules described below to avoid injury to the operator and damage to the machine.
Carefully read the labels on the machine, do not cover them for any reason and replace them immediately if they become worn or damaged.
Do not place containers with liquids on the machine.
The machine storage temperature should range between -25°C and +55°C.
Humidity should range between 30 and 95%.
Do not use the machine in an explosive atmosphere.
Do not use the machine as a transport vehicle.
Do not allow the brushes to operate while the machine is stationary to avoid damaging to the floor.
In case of fire, use a powder extinguisher. Do not use water.
Do not bump into shelves or scaffolding where there is a risk of falling objects.
Adjust the operating speed to the floor adhesion.
Do not exceed the declared slope limits to avoid unstable conditions.
When the machine is parked, remove the key and engage the parking brake.
When machine operating malfunctions occur, make sure that they are not caused by a lack of routine maintenance. If not, request assistance from the service centre.
If parts must be replaced, request ORIGINAL spare parts from a dealer and/or Authorised Retailer.
For all maintenance operations, disconnect the electric power supply to the machine.
Do not remove the guards which require the use of tools to be disassembled.
Do not wash the machine with direct or pressurised water streams, or with corrosive substances.
The machine should be inspected by a service centre every 200 hours of operation.
The machine must never be left unattended, during the scrapping phase, because of the presence of toxic-harmful materials (batteries, oils, etc.) which are subject to standards that require disposal in special centres.
The machine will not generate damaging vibrations.

MODIFICATION AND IMPROVEMENTS
Our company constantly improves its products and reserves the right to make changes and improvements at its discretion without being obligated to apply such benefits to the machines that were previously sold.

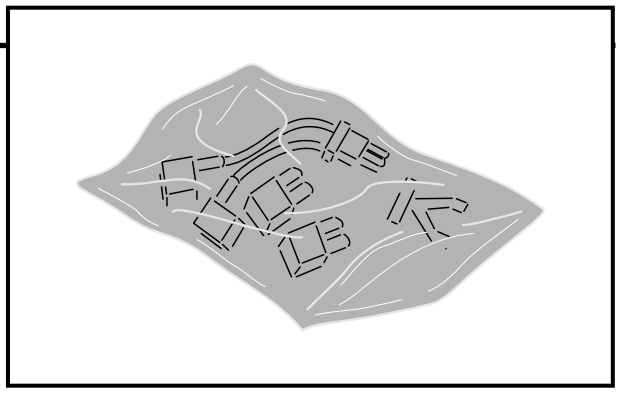
SAFETY
How to prevent accidents.

No accident prevention programme is effective without the complete co-operation of the person directly responsible for operating the machine.
Most of the accidents that may occur in a company, on the job or during transfers are caused by the non-observance of the fundamental safety rules.
A careful and cautious user is the best guarantee against accidents and is more effective than any type of prevention programme.

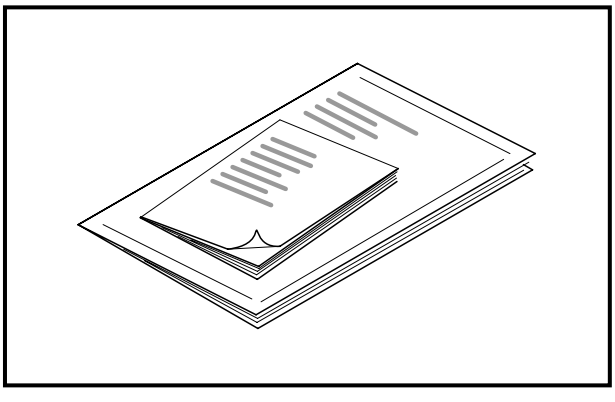
SAVE THESE INSTRUCTIONS!

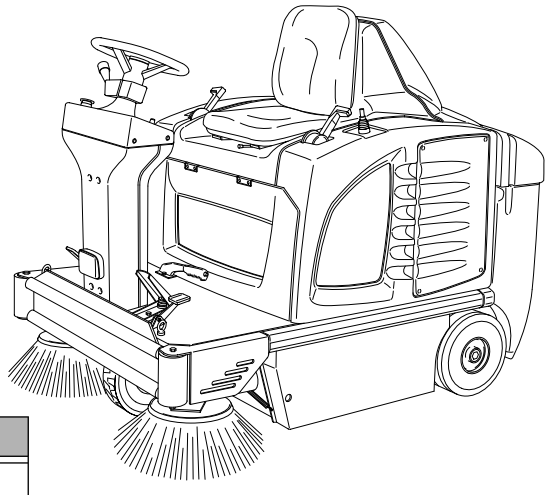
Please check that the following items be supplied with the machine:

1- envelope with cables for batteries and connector for battery-charger.



2- technical documents (Spare Parts Catalogue, Manual for Use and Maintenance and - for the gasoline version only - Use and Maintenance Manual of the engine).

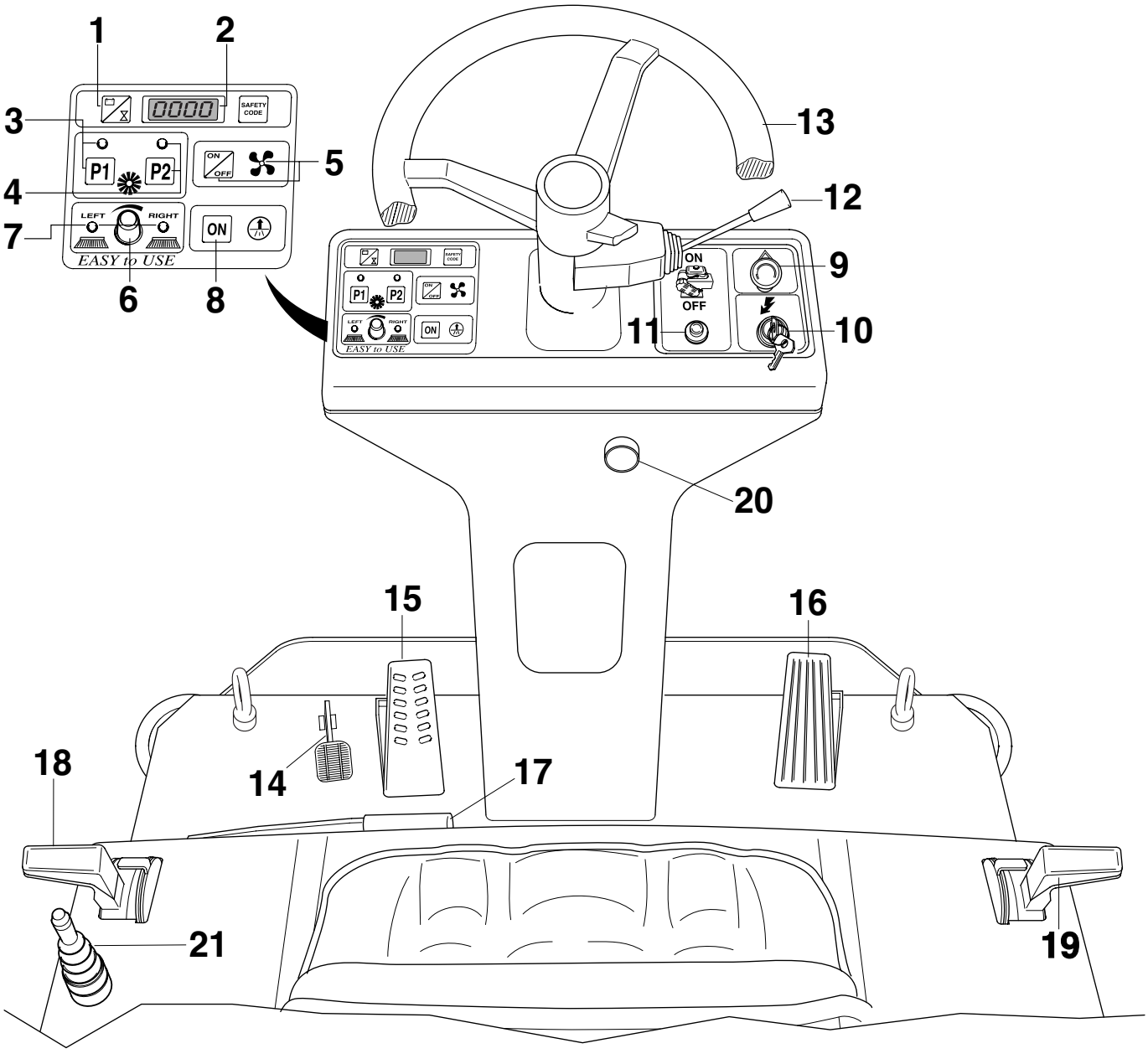




VERSION	SR 1300 ECO	SR 1300B
Voltage	24V	24V
Engine model	Vanguard OHV	/
Nominal Power at 3600 RPM	4 Hp - 2,95 Kw	/
Displacement	126 cc (7,69 cu.in)	/
Start	Automatic	/
Drive electrical motor	750W - 315 RPM	750W - 315 RPM
Main brush electrical motor	500W - 1600 RPM	500W - 1600 RPM
Suction electrical motor	200W - 3300 RPM	200W - 3300 RPM
Centrifugal motor fan	24V - 2800 RPM	24V - 2800 RPM
Side brush electrical motor	90W - 120 RPM	90W - 120 RPM
Forward speed	6,5 km/h (4,03 mil/h)	6 km/h (3,7 mil/h)
Reverse speed	4,3 km/h (2,6 mil/h)	3,5 km/h (2,2 mil/h)
Max slope	20%	20%
Main brush	Ø 300 x 800 mm (11,8 x 31,4 in)	Ø 300 mm x 800 mm (11,8 x 31,4 in)
Side brush	Ø 460 mm (18,11 in)	Ø 460 mm (18,11 in)
Cleaning width with 1 side brush	1012 mm (40 in)	1012 mm (40 in)
Cleaning width with 2 side brushes	1251 mm (49 in)	1251 mm (49 in)
Front wheel (nr. 1)	Ø 300 mm (12 in)	Ø 300 mm (12 in)
Rear drive wheels (nr. 2)	Ø 300 mm (12 in)	Ø 300 mm (12 in)
Dirt container capacity	112 l (30 gal)	112 l (30 gal)
Panel filter	6,5 m^2 70 sq.ft	6,5 m^2 70 sq.ft
Electrical filter shaker	90W - 6000 RPM	90W - 6000 RPM
Machine length	1490 mm (58,6 in)	1490 mm (58,6 in)
Machine width	1000 mm (39 in)	1000 mm (39 in)
Machine height	1250 mm (49 in)	1250 mm (49 in)
Weight w/o battery	473,3 kg (1043 lb.)	424 kg (935 lb.)
Fuel tank capacity	7 l (1,8 gal)	/
Engine oil tank capacity	0,71 l (0,15 gal)	/

Recommended battery: 2 x 12V 105Ah @ 20 for ECO version
4 x 6V 305Ah for BATTERY version

DESCRIPTION OF COMMANDS AND CONTROL PANEL

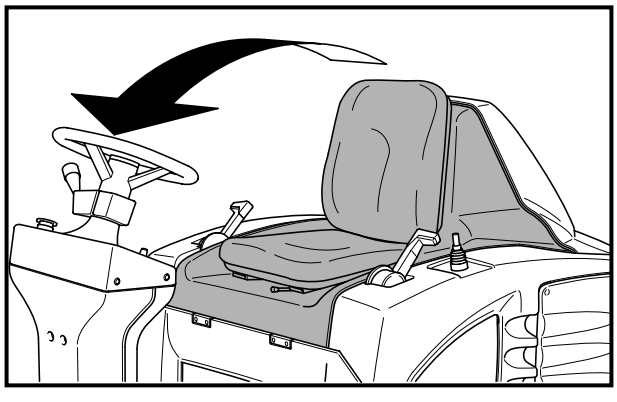


1- Voltmeter/hourmeter push button
2- 4 digits display
3- Button for selection/indicator of working program P1
4- Button for selection/indicator of working program P2
5- ON/OFF button and indicator of suction motor
6- Knob for the speed adjustment of the side brushes
7- Indicator of the operation of left/right side brushes
8- ON button of filter-shaker motor
9- Emergency stop push button
10- ON/OFF main key switch
11- Start/Stop push button for gasoline engine
12- Selection of forw./reverse speed, light ON/OFF, horn
13- Steering wheel
14- Pedal for flap lifting
15- Brake pedal
16- Accelerator
17- Parking brake lever
18- Lever for left side brush command
19- Lever for right side brush command
20- Enable button for hopper lifting
21- Hopper control lever (lifting and door opening)

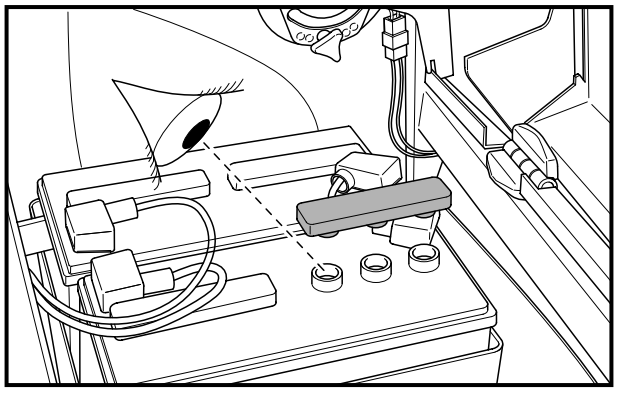
The machine-both the gasoline and the battery version-is equipped with a 24 Volt group of batteries.

Depending on the country where the machine is sold three possibilities can occur:

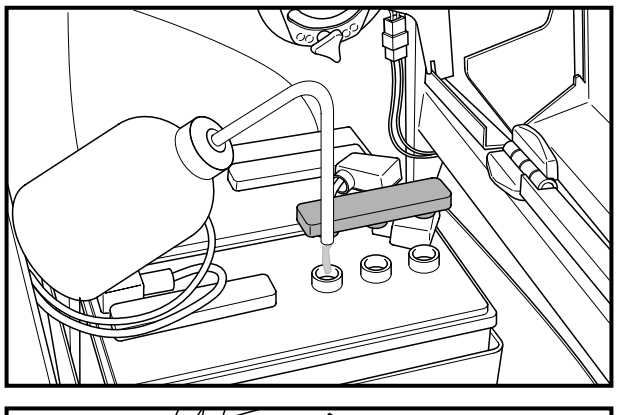
1- the battery is supplied with the machine and it is set, complete with acid solution
2- the battery is supplied with the machine and it is set, but not complete with acid solution
3- the battery is not supplied.



The battery compartment is under the seat: lift the compartment lid, toward the steering wheel, and verify which one of the three possibilities is applied to your machine.

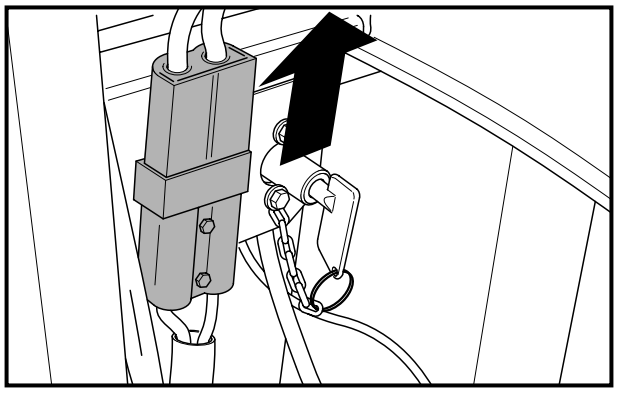


If the batteries are installed open one of the caps of every battery and check if they are filled with electrolyte.



1- If the battery is filled:

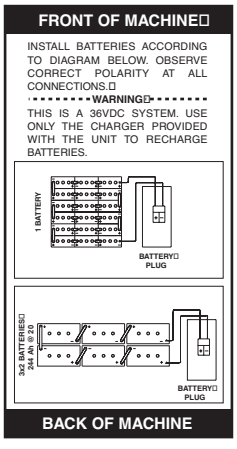
1a. Check the electrolyte level in every cell and -if necessary- fill up with distilled water.
1b. Proceed with a battery recharge according to the MAINTENANCE paragraph and to the Battery User Manual.

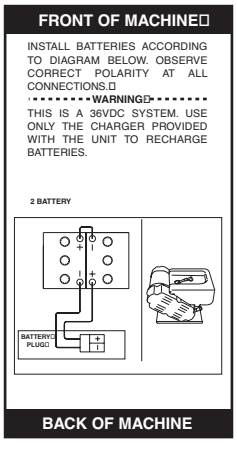


<u>WARNING: before stating the battery recharge the battery connector must be disconnected from the machine.</u>

After the recharge plug the battery connector to the machine.

2- If the batteries are installed but not filled with acid solution they must be filled with a solution of sulphuric acid (density not lower than 1.270 Kg when at 25°C) according to the instructions specified below and in the Battery User Manual.


FRONT OF MACHINE
INSTALL BATTERIES ACCORDING TO DIAGRAM BELOW. OBSERVE CORRECT POLARITY AT ALL CONNECTIONS.
WARNING
THIS IS A 36VDC SYSTEM. USE ONLY THE CHARGER PROVIDED WITH THE UNIT TO RECHARGE BATTERIES.
1 BATTERY
BATTERY PLUG
3x2 BATTERIES 244 Ah @ 20
BATTERY PLUG
BACK OF MACHINE

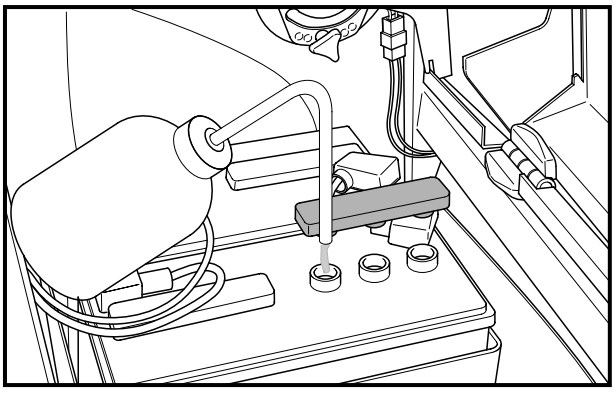

FRONT OF MACHINE
INSTALL BATTERIES ACCORDING TO DIAGRAM BELOW. OBSERVE CORRECT POLARITY AT ALL CONNECTIONS.
WARNING
THIS IS A 36VDC SYSTEM. USE ONLY THE CHARGER PROVIDED WITH THE UNIT TO RECHARGE BATTERIES.
2 BATTERY
BATTERY PLUGS
BACK OF MACHINE

BATTERY FILLING UP WITH ACID SOLUTION
Warning: the battery acid is corrosive; if it comes in contact with the skin or eyes rinse thoroughly with water and consult a physician.

The batteries must be filled in a well ventilated area.

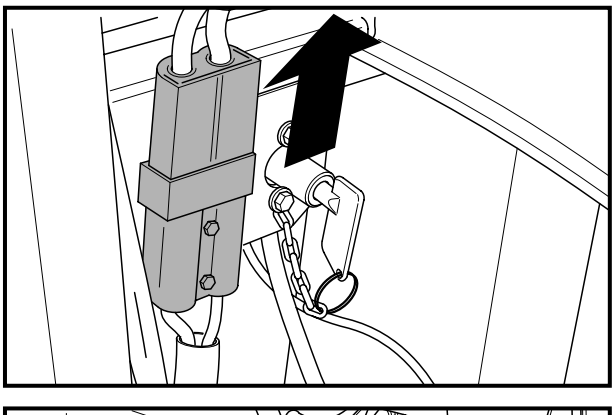
Fill every battery cell with acid; the right level is specified in the Battery User Manual.

After one hour fill up with acid, if necessary.

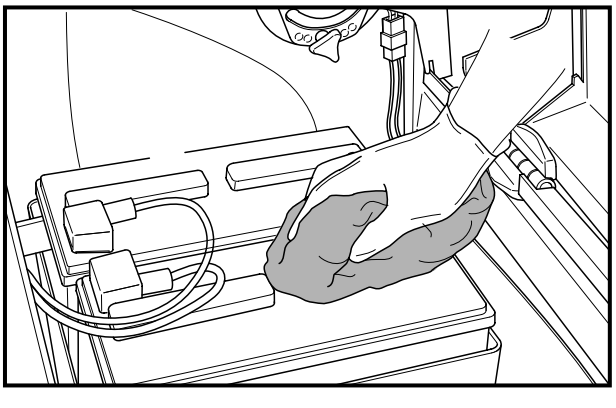


Let batteries rest for a further hour; then proceed with a recharge according to the instructions specified in the Battery User Manual and in the MAINTENANCE paragraph. During the recharge the battery caps must be open.

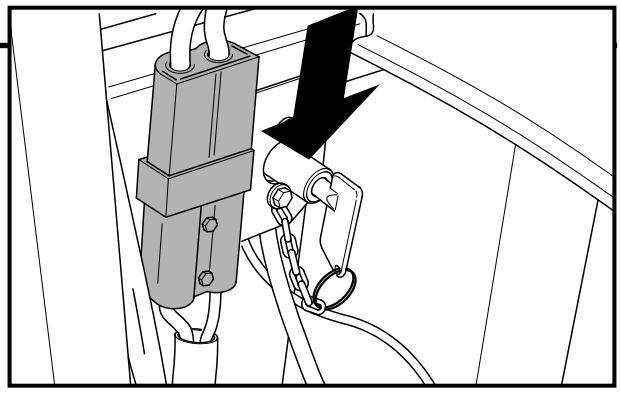
<u>WARNING: before starting the recharge the battery connector must be disconnected from the machine.</u>



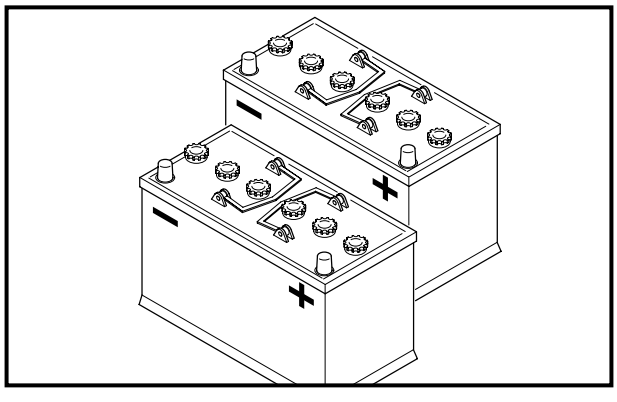
After the recharge close all the cell caps and clean the top of the battery from any acid remains.



Connect the battery connector to the machine.

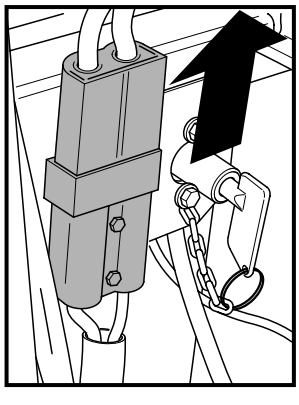


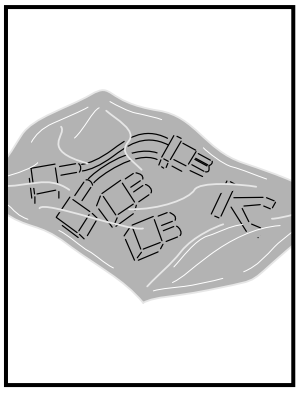
3- If the machine is not equipped with batteries they must be procured and mounted. It is recommended to get the assistance of qualified personnel to chose and set the batteries.



The electrical cables supplied with the machine can be used for the connection of the batteries.

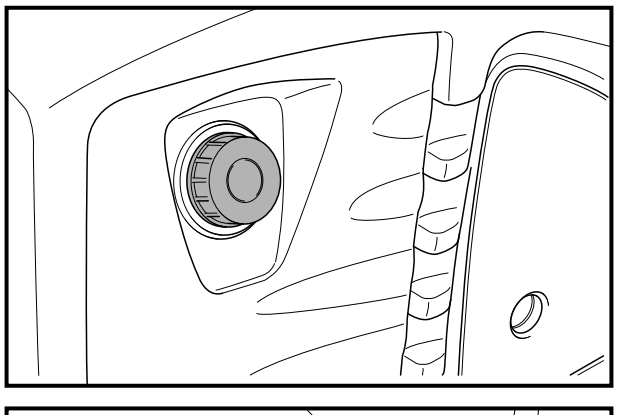
WARNING: before starting the recharge the battery connector must be disconnected from the machine.





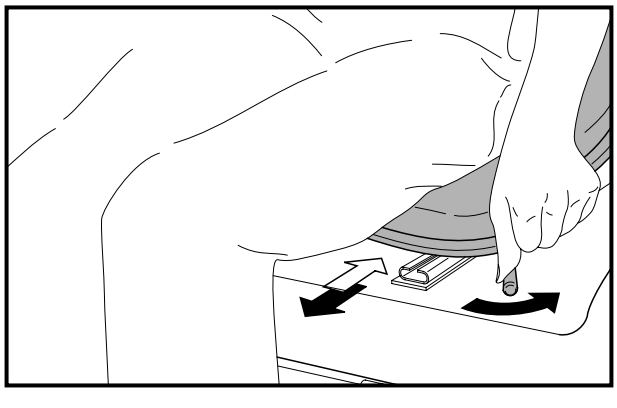
If the machine is equipped with a gasoline engine (gasoline version) fill the fuel tank with unleaded gasoline.

Check the engine oil level (see the chapter "MAINTENANCE").



Climb onto the machine and adjust the seat to find the most comfortable position.

Now the machine is ready to be used.



TURNING THE MACHINE ON

Insert the ignition key into the panel and turn it clockwise: the display will show only zeros and after about three seconds the battery voltage will appear.

Note: the temporary lighting of the side brush indicators and the short sound from the reverse speed acoustic indicator correspond to a normal behaviour.

Wait not less than three seconds before restarting the machine after switch Off.

Check the charge status of the batteries on the display.

Six different data/functions s can be shown on the display.
The six functions are described in the following table.

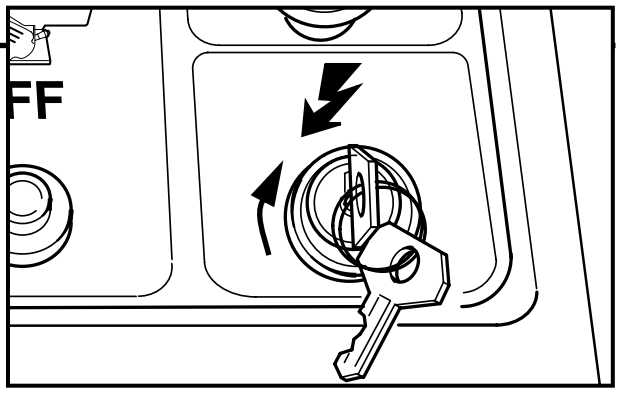
Displayed datum/function	Display reading
1. Voltmeter: the battery voltage is normally shown on the display. A block function will be activated in case of battery undervoltage: when battery voltage will be about 20V all machine functions will stop, except traction; in this case the display will show **0205**; proceed then with a battery recharge (see Maintenance paragraph). A different voltage cut –off value can be selected for wet and gel batteries respectively.	Normally fixed. Flashing when 0205 appears.
2. & 3. Hourmeter: to read the machine working time - in hours - press once the yellow display button. By pressing the button a second time the working minutes will appear. Just waiting ten seconds the display will show the battery voltage again	Fixed
4. Total swept surface (yd^2): the displayed value will increase each 1000 yd^2	Fixed
5. Daily swept surface (yd^2): the displayed value will increase each 10 yd^2	Fixed
6. Productivity: sweeping rate yd^2/h: it depends on the instantaneous machine working speed	Flashing

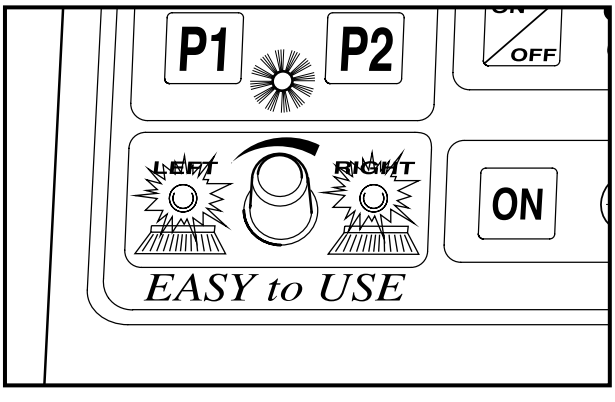
Notes:
- to pass to the next function press the yellow display button once
- the display will return automatically to the battery voltage from every function
- data 2 and 3 will increase just using the traction function (accelerator pedal)
- data 4, 5 and 6 will increase only if main broom is turning AND traction function is used
- when datum 5 is displayed you can reset it just by keeping the yellow display button pressed 5 seconds.

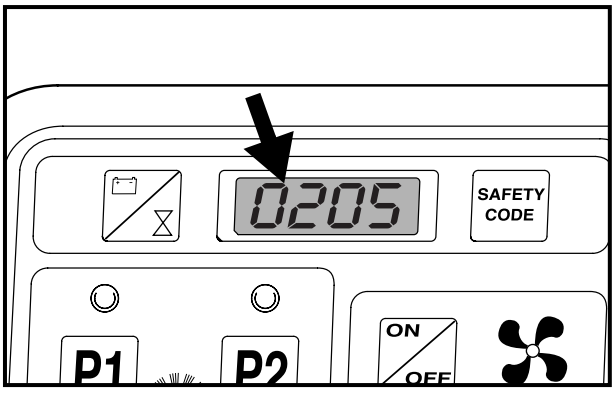
- If the batteries are charged enough, now it is possible to start the job (in battery mode).
  If the machine is equipped with the gasoline engine, proceed with the start of the engine itself.

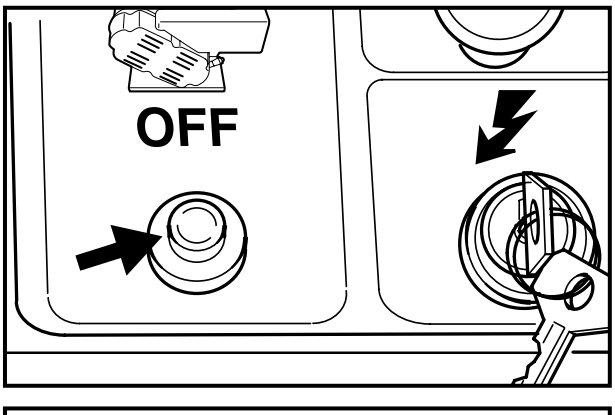
START/STOP OF THE GASOLINE ENGINE

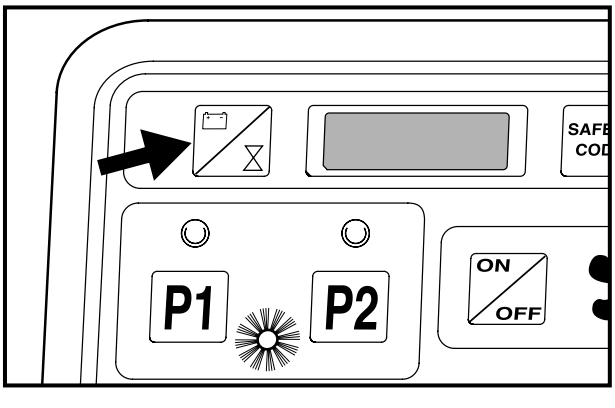
To start the gasoline engine press the red button shown in the figure; to stop the engine press the same button again.



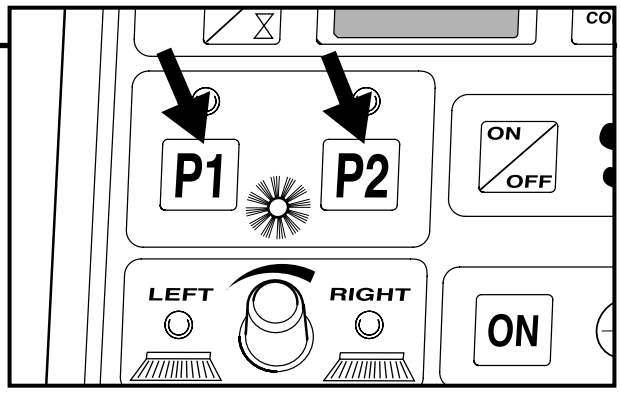




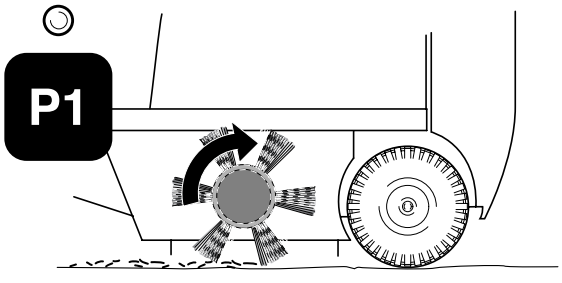


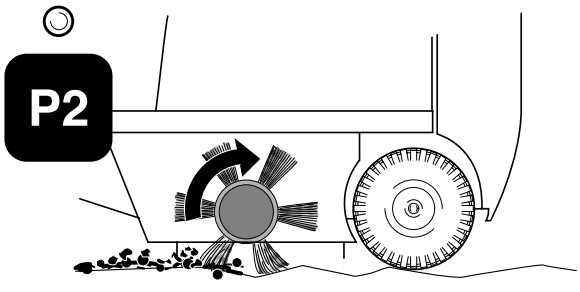


USE OF THE WORKING PROGRAMS

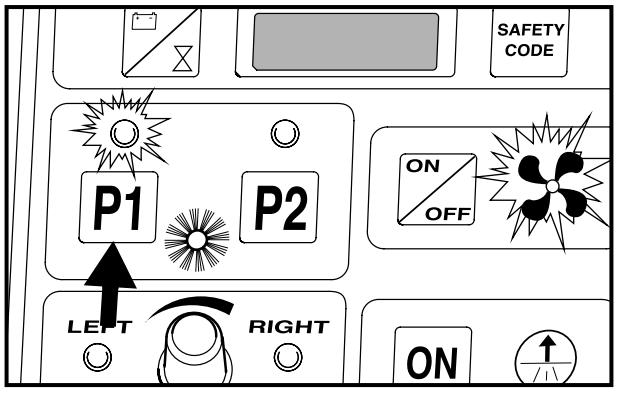


When the machine has been turned on and, eventually, after the start of the gasoline engine, it is possible to choose one of the two working programs **P1** and **P2** pressing the relevant button:
P1 is the "light cleaning program" (for internal environment, i.e. smooth floor, moquette, small debris etc.)
P2 is the "hard cleaning program" (for external environment, i.e. asphalt, uneven floor, big debris etc.).



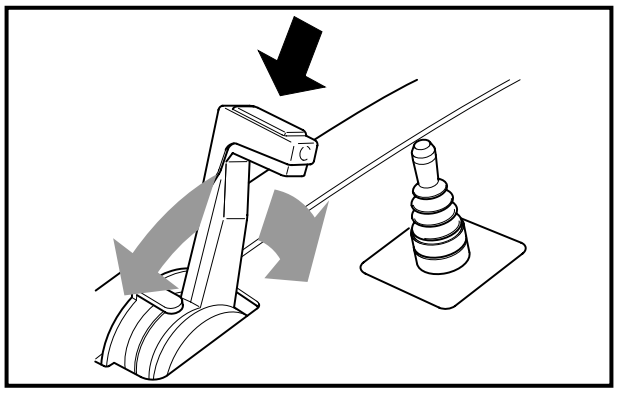


After having pressed the preferred button the relevant light indicator will turn on, together with the suction motor indicator.
The temporary activation of the main brush and suction electrical motors will also occur; (the relevant light indicators will flash).



Note: the working parameters of programs **P1** and **P2** are pre-set by the manufacturer of the machine: if you want to change the pre-set values call the customer service personnel of your supplier.

Lower the side brush/es pressing the top of the relevant lever and moving it forward,

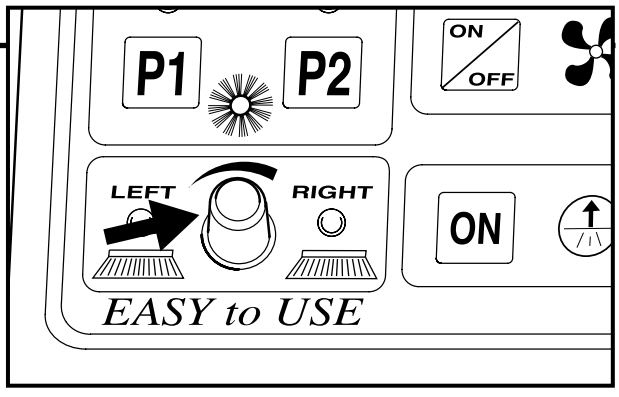


Note: on the control panel the corresponding light indicators will turn on.

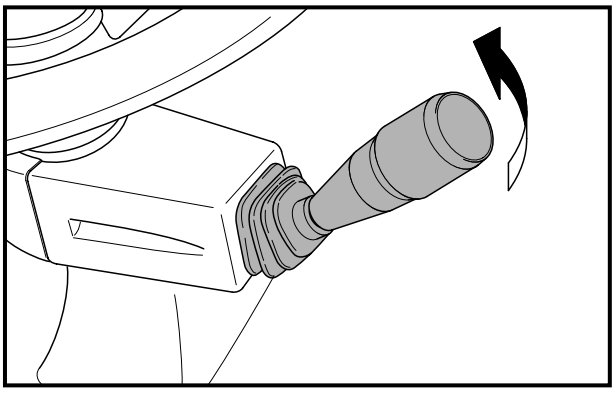
To lift the side brush/es press the top of the levers and move them backward.

Note: the side brush/es, the main brush and the suction fan will start automatically when the accelerator pedal will be pressed (AUTO POWER-ON).

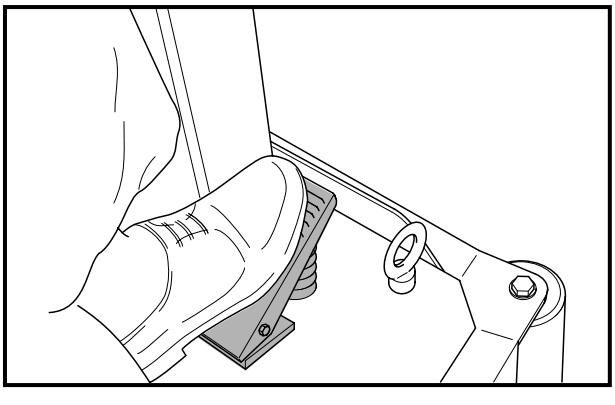
It is possible to adjust the side brush/es turning speed by means of the dedicated knob.



Select the forward speed by means of the command lever.

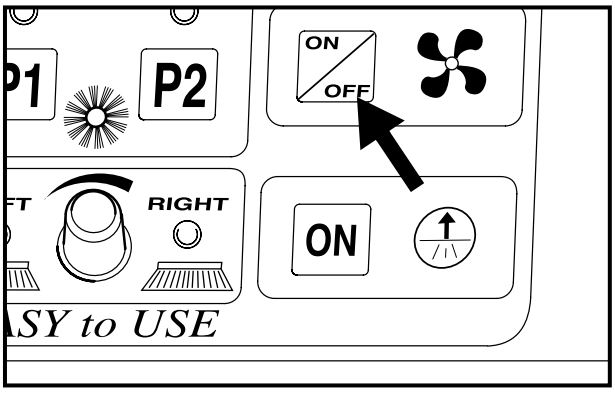


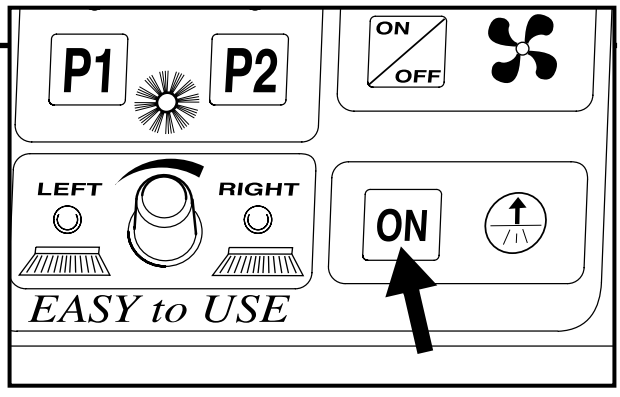
Press the accelerator pedal to start the job.



Note: by releasing the accelerator pedal (or setting the command lever to the neutral position) the automatic switch off of all functions will occur within 8 seconds (Auto Power Off) except the gasoline engine; the light indicators of the selected working program and of the suction fan will start flashing. The automatic restart of all functions will automatically occur as soon as the accelerator pedal will be pushed again (Auto Power ON). In order to enable the selection of a different working program first disable the previously selected one.

When it is necessary to sweep on a wet floor stop the suction fan pressing the relevant button, in order to prevent the damage of the paper panel filter with water.

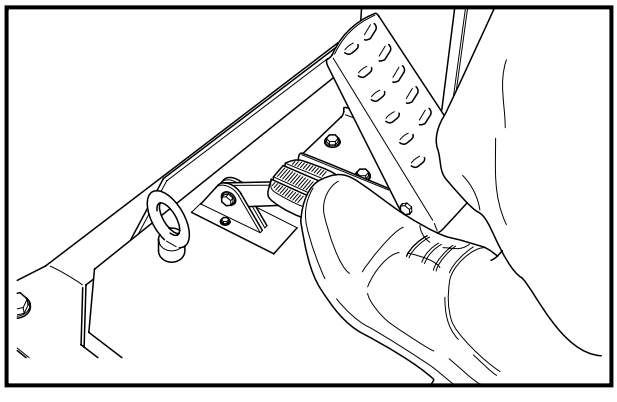




In order to get an efficient cleaning function the panel filter must always be clean.

Press the filter-shaker button, even if the machine is working.

This operation must be repeated every 10 to 15 minutes, depending on the kind of rubbish to be swept; before emptying the dirt container and, in any case, at the end of the work.

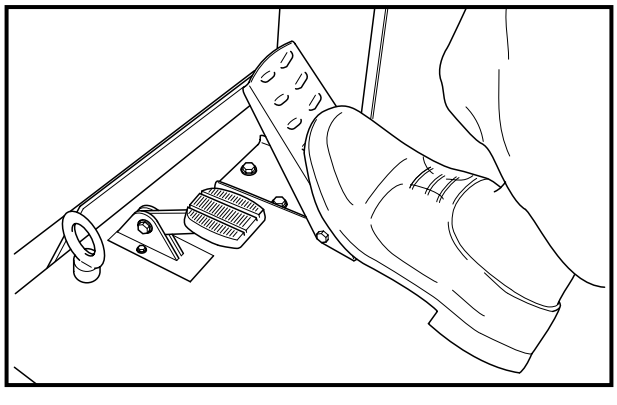


During the operation of the filter-shaker the suction fan will continue to run (no automatic stop will occur). If you want to stop the suction fan during the filter shaker operation - two possibilities exist:

1st- to stop the fan by pressing the dedicated ON/OFF button.

2nd- to wait for the functions automatic power off (after the release of the accelerator pedal)

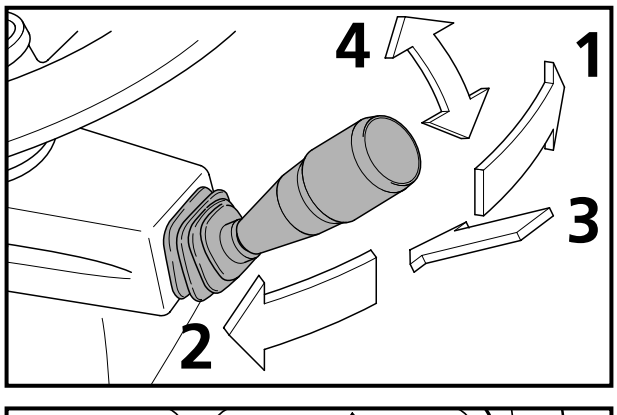
To restart the suction fan either press the ON/OFF button or use the accelerator pedal.
As an alternative - in order to make easier the operator's job - the automatic filter sheaking will occur, every five minutes.



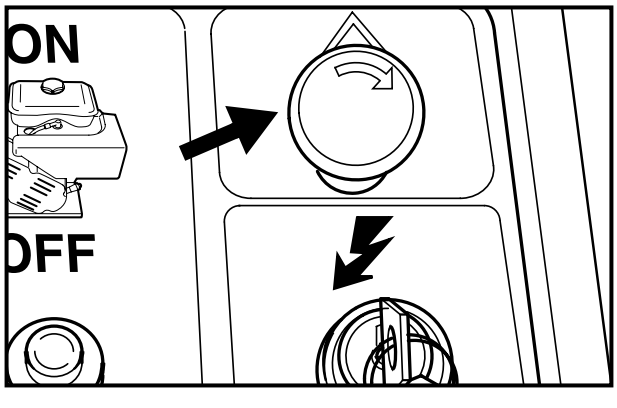
To collect light and bulky waste materials lift the front flap using the left pedal (do not press the pedal down for a long time, not to reduce the suction capability of the machine).

The machine get an automatic breaking function when the accelerator pedal is released; when necessary the service brake can also be used (see the figure).

When driving reverse an intermittent acoustic signal will be heared and all the functions will remain enabled.

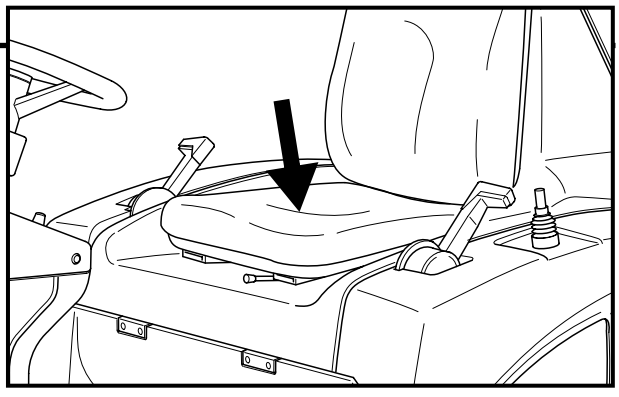


In the figure the functions of the command lever are shown:
1- forward speed
2- reverse speed
3- horn
4- front light On/Off.

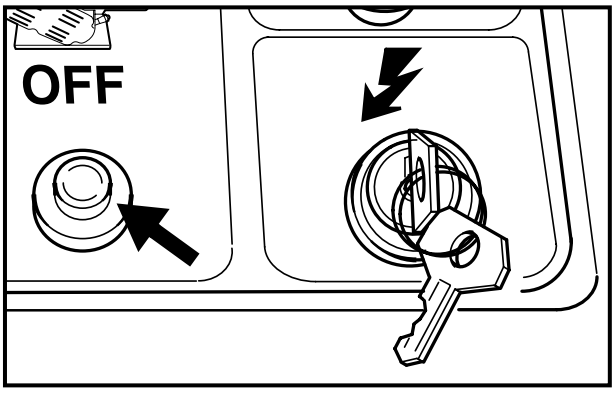


The machine is equipped with an emergency stop button; by pressing this button (red light On) a sudden stop of the machine will occur and all functions will turn Off, the gasoline engine too.
To restart the machine turn the red button clockwise (according to the arrow shown on the button itself).
To restart the normal operation re-select one of the two working programs **P1** or **P2** and restart the gasoline engine.

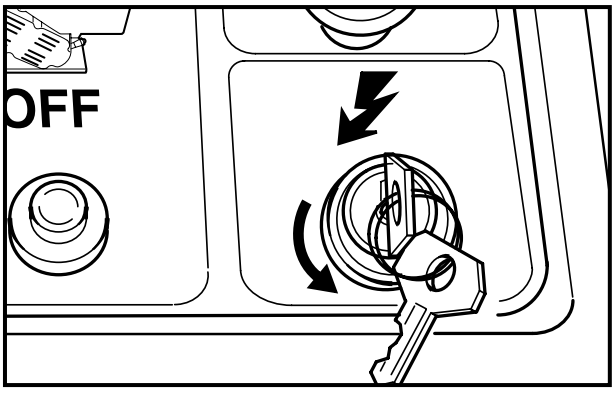
A safety device is located inside the operator seat: the drive function - either forward or reverse - is disabled as soon as the operator will stand up or leave the seat.



At the end of the job turn off the selected working program (P1 or P2) and switch the gasoline engine Off pressing the button shown in the figure.



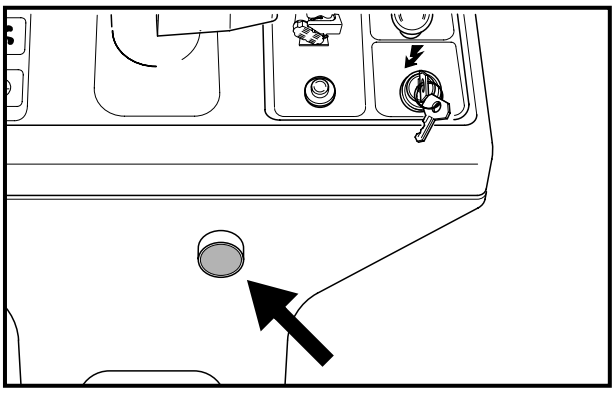
Before leaving the machine make sure that the side brush/es be lifted, the parking brake engaged and the master key in the Off position (counter-clockwise).

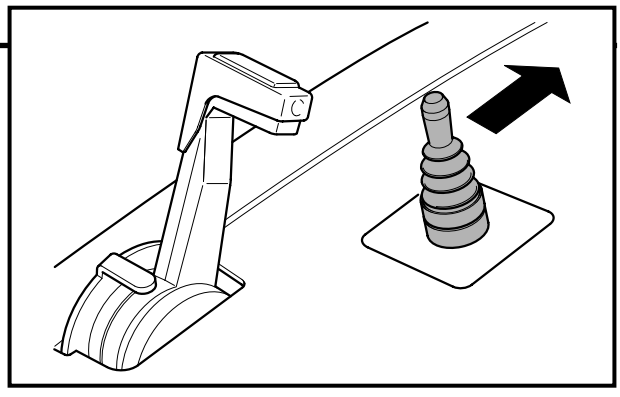


At the end of the job or whenever it is necessary empty the rear dirt container.

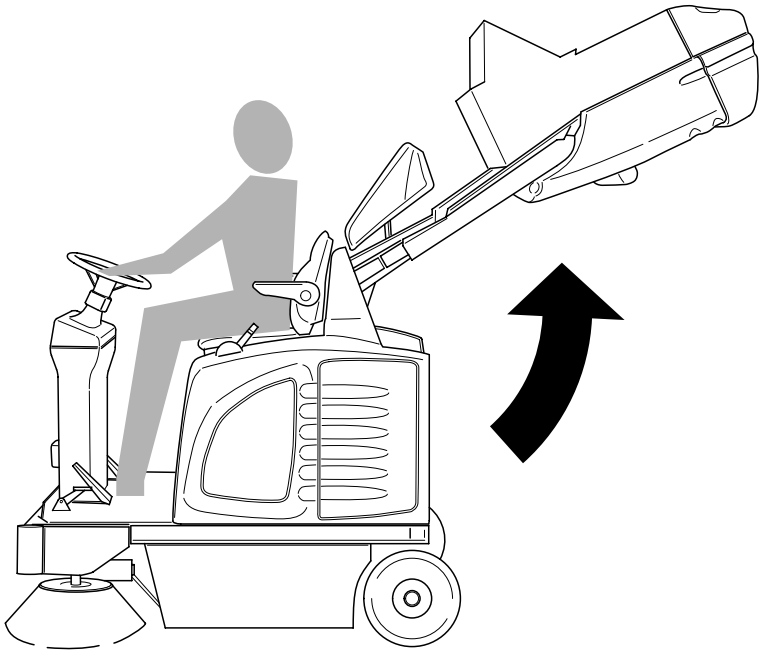
WARNING: Be sure not to be near to any person and not to cause any damage or accident.

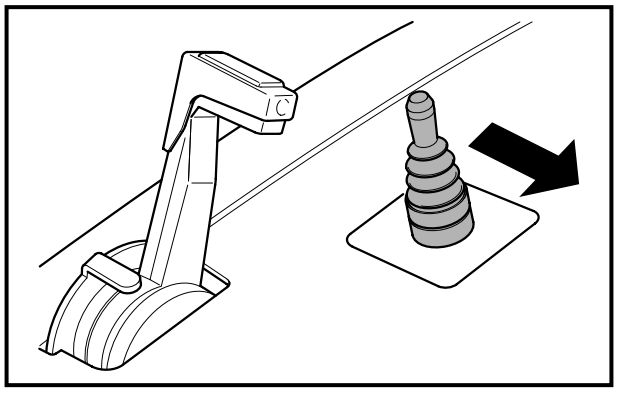
For safety reasons, the dirt tank control lever can be operated only if, at the same time, the right hand presses the safety red button (see figure) and the left one acts on the control lever.



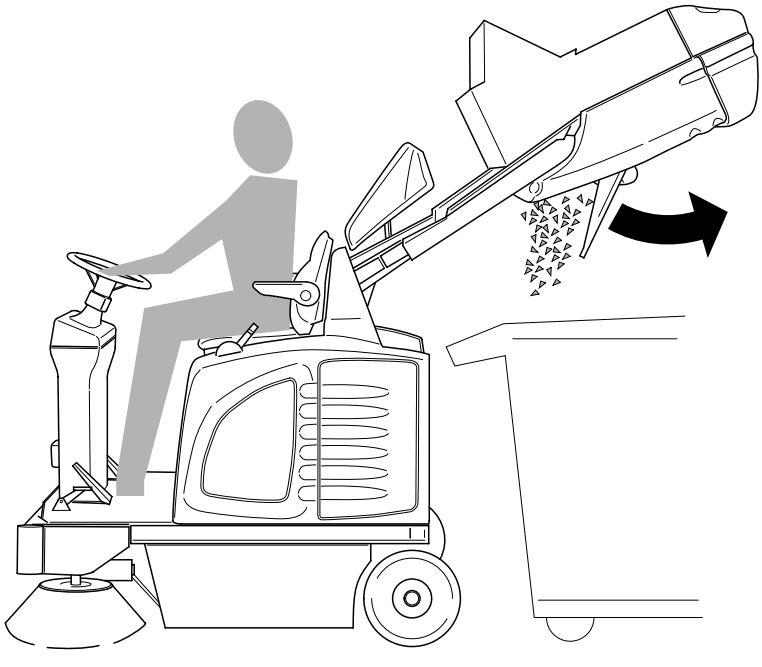


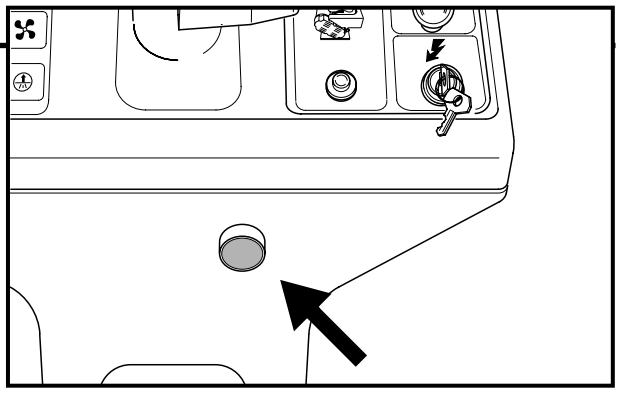
To lift the tank move the lever rearward as shown in the figure.





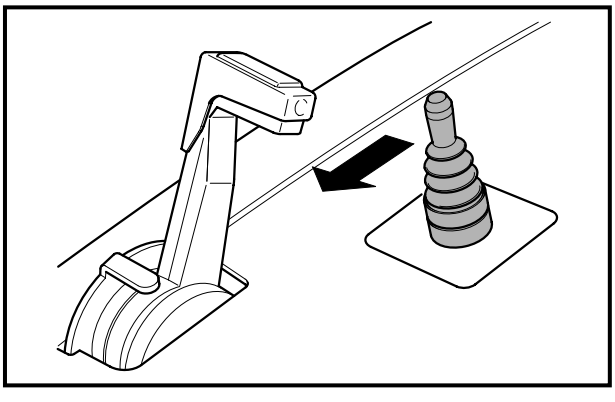
Approach the rubbish-bin.
Release the lever that places itself centrally, push it on the outside until the tank door is opened to allow the discharge of the picked up material.

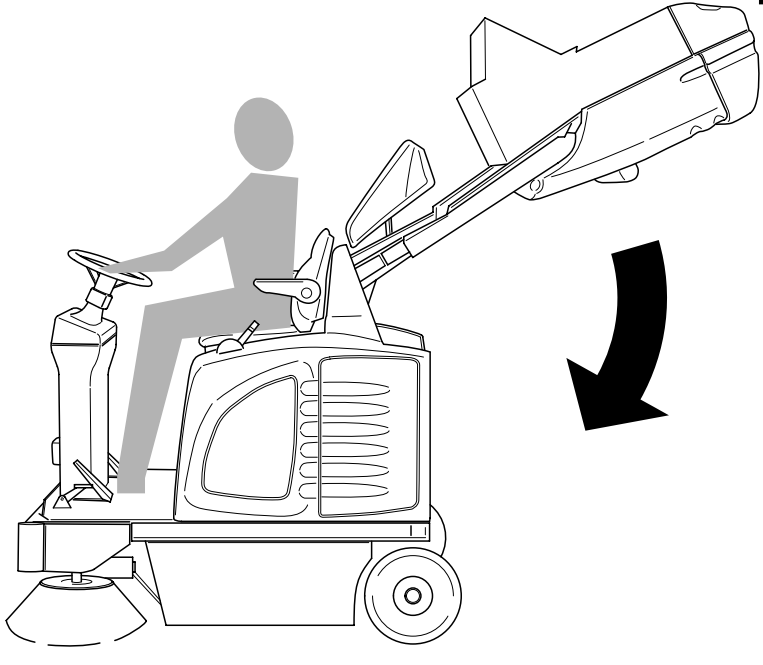




After discharging, release the lever that will move to the central position so to close the rear tank door.

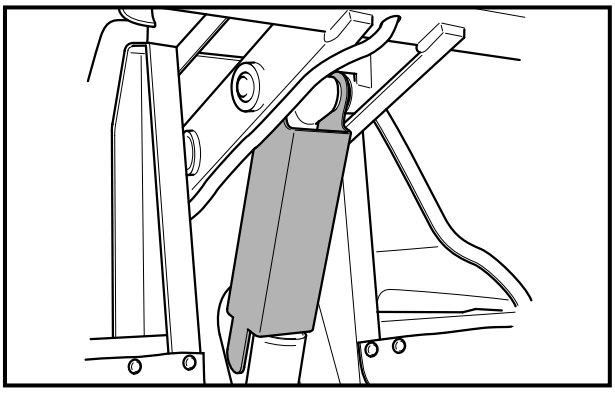
Move away from the rubbish bin, then move the lever onward, press again the red button so that the tank comes back to the starting position (lowered).



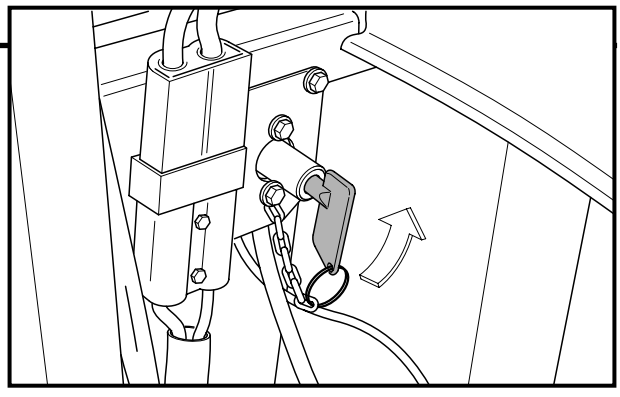


WARNING: Don't drive the machine while the tank is lifted, except than for the moves necessary to approach/move away to/from the rubbish bin.

Make sure the Hopper Safety Support is in place whenever attempting to do any maintenance work under or near the raised hopper.
Lift the hopper to its maximum height by pressing the red safety button and moving the JOY STICK; put the safety device in the holding position and lower the hopper enough to lock it



Lift the hopper (using the joy stick plus the red button) in order to disengage the safety device; lower the hopper to the rest (lowest) position.



In the event that the machine must be pushed in Off condition or without batteries turn the proper key counter-clockwise (see the figure), in order to disengage the electrical drive motor and disable the self-breaking function. Turn and eventually remove the red key that can be seen after lifting the lid of the engine/battery compartment.

FURTHER PERFORMANCES OF THE MACHINE WITH GASOLINE ENGINE

The machine equipped with the gasoline engine is able to work with full performance even if the gasoline engine is turned Off; this could occur just because the machine run out of the fuel or when it is necessary to work in a closed environment.

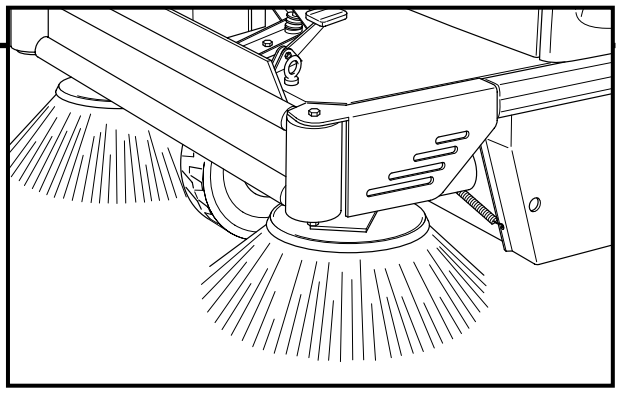
In this case the available working time will depend on the capacity (amper.hours) of the batteries installed on the machine; on the intensity of the selected working program; on the charge status of the batteries.

On this machine, in order to guarantee the reliability of the batteries, two safety features are envisaged:

1- protection against the deep discharge of the battery: when the battery voltage drops down to about 20 Volt the automatic stop of all function will occur - except the traction function. When in this condition, it is necessary to proceed with the recharge of the battery. A different voltage cut-off value can be selected for wet and gel batteries respectively.

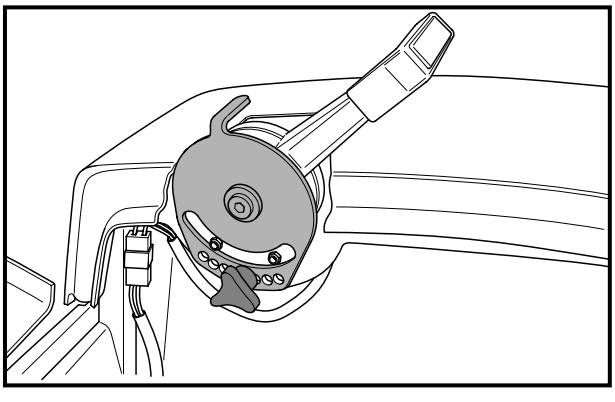
2- Protection against the excessive recharge. If the battery voltage will reach the value of about 29 Volt the automatic stop of the gasoline engine will occur.; in any case the machine will still be able to operate only with batteries. The gasoline engine can be restarted when the battery voltage will be low enough (at about 24 Volt).

SIDE BRUSHES ADJUSTMENT AND REPLACEMENT

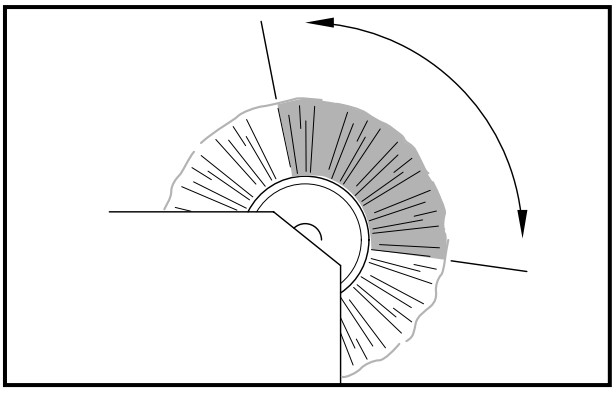


Warning: the following operations must be done with the machine in Off condition and the master key out, on a flat floor.

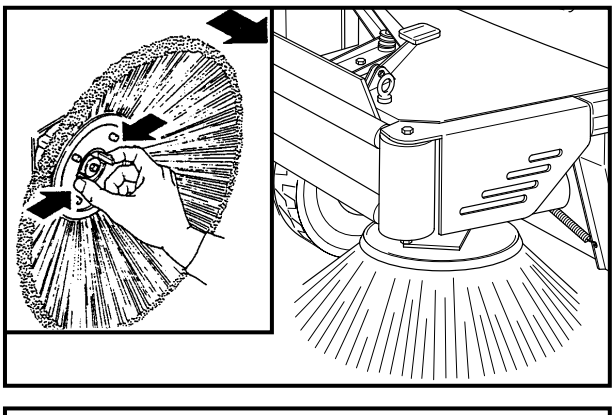
When the side brush is worn its height must be adjusted.



Loosen the knob. Turn the adjusting disk and tighten the knob.

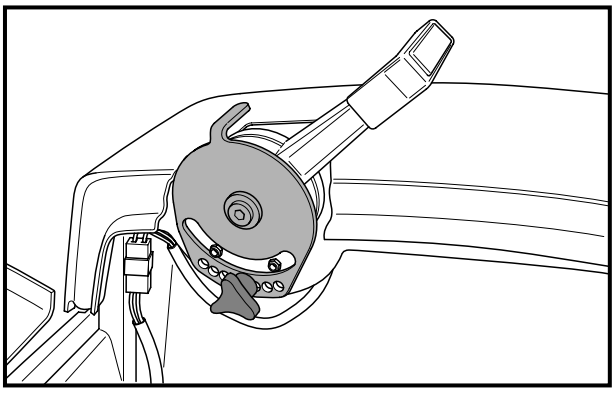


To check the adjustment of the brush start it and verify that the contact with the floor is as shown in the figure. If necessary repeat the adjustment sequence.



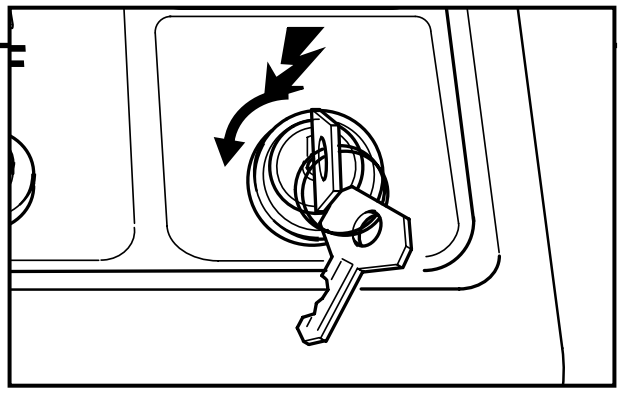
When the brush is remarkably worn out, it is necessary to replace it. Just press the two tabs inwards and remove the brush.

Reinstall the new brush by carring out the reverse operation; press the brush with your hands.



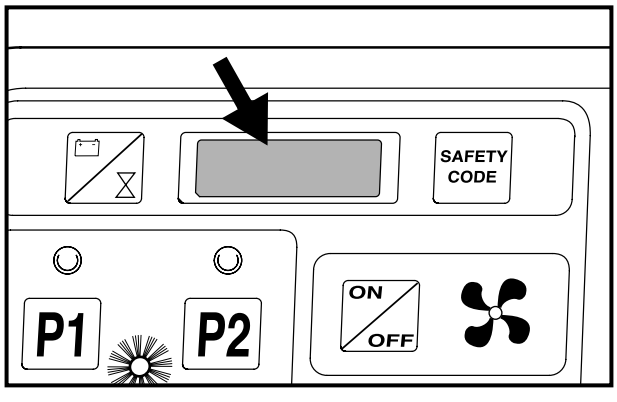
Note: when the brush is replaced set the adjusting devices to their original position (corresponding to brush new, with no wear).

MAIN BRUSH REPLACEMENT

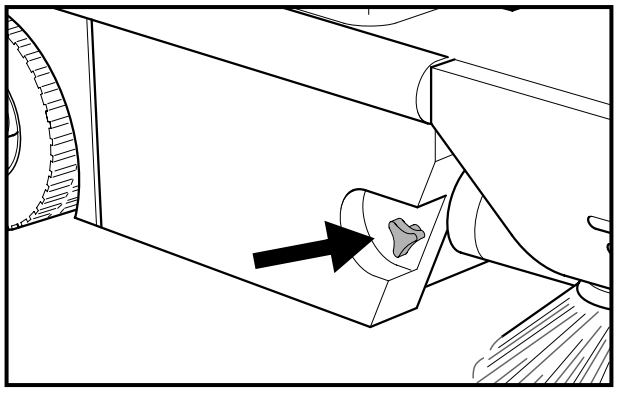


Warning: the following operations must be done with the machine in Off condition and master key out.

This machine is equipped with an automatic control of the main brush pressure; this also means that the position of the main brush is automatically adjusted (no need of manual adjustment).

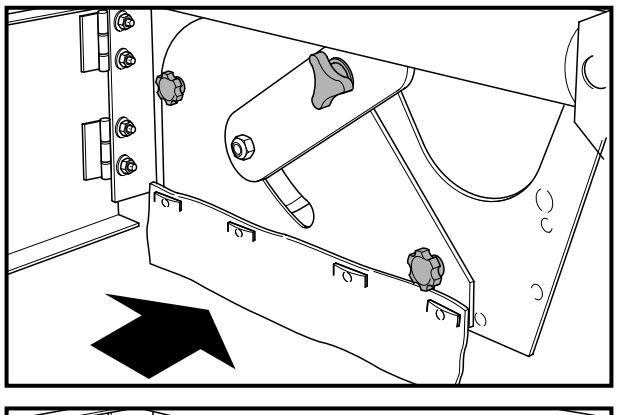


The complete wear of the main brush - and then the need to replace it - is notified with code 800 on the display.

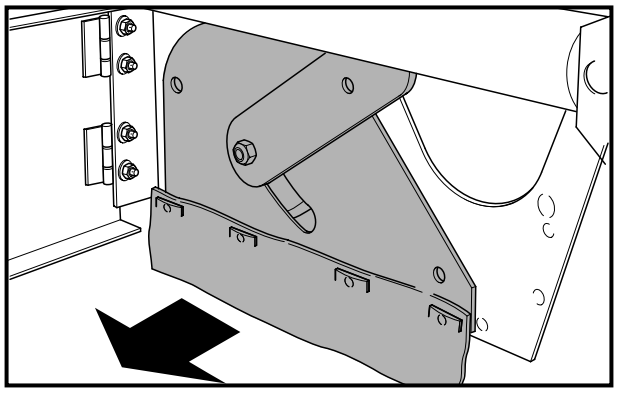


Please meet the following procedure for the main brush replacement.

Open the side door on the right side of the machine, unscrewing the knob shown in the figure.



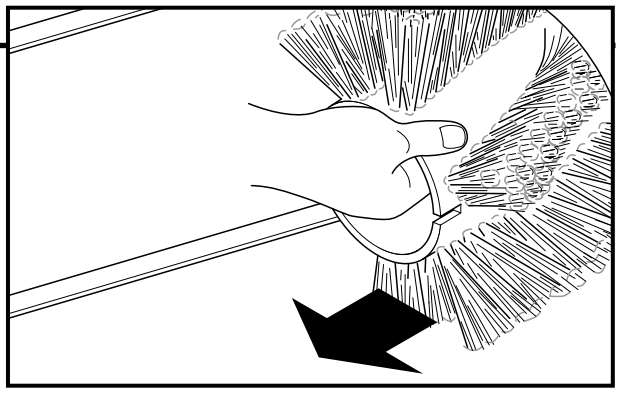
Remove the three knobs used to fix the lid of the main brush compartment.



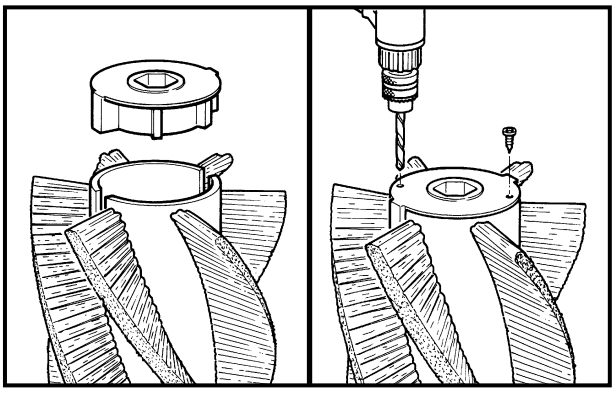
Remove the lid of the main brush compartment.

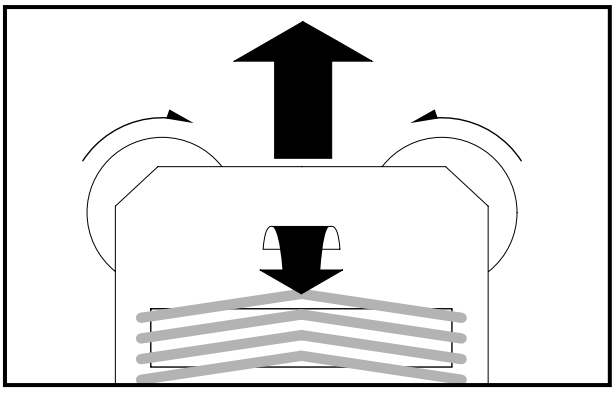
MAIN BRUSH REPLACEMENT

Remove the worn brush.

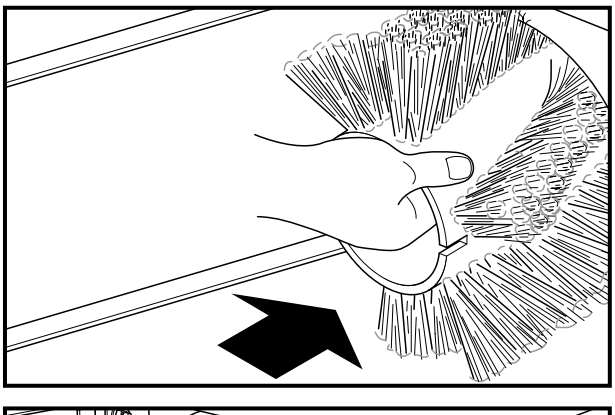


Remove the plastic adapter from the worn brush, using a screw driver.
Fix the plastic adapter to the new brush: pay attention to the correct angle of the brush bristles (look at the next figure).

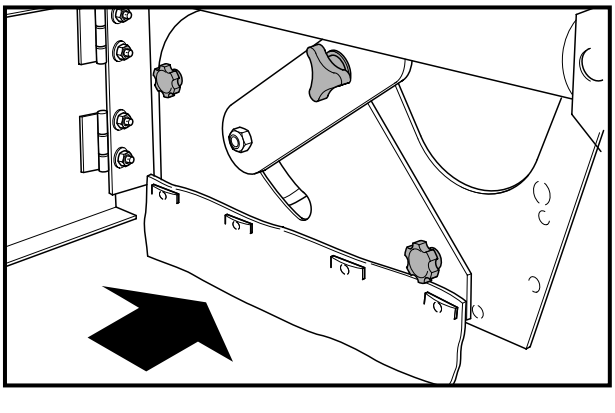




Fit the new brush in its compartment, paying attention to the engagement of the plastic adapter with the hub on the opposite side of the compartment.



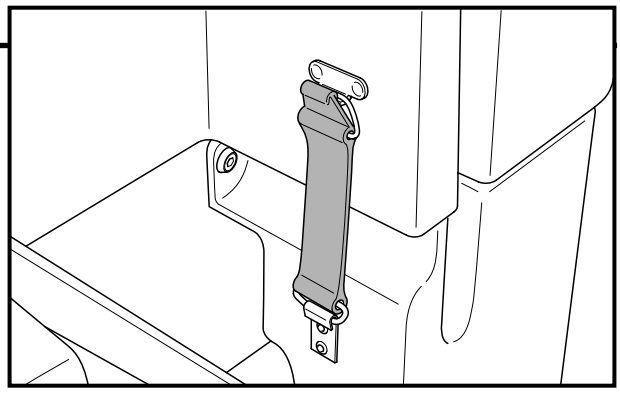
Fit the lid of the main brush compartment using the three knobs previously removed.



FILTER CLEANING AND REPLACEMENT

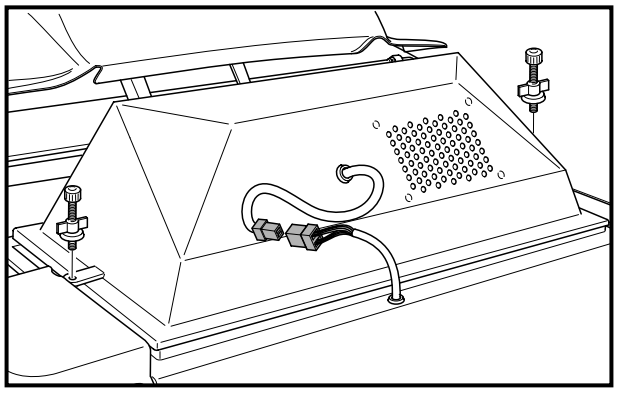
The panel filter requires a regular cleaning.

Lift the hopper just to get access to the two rubber locks used to hold the external cover.



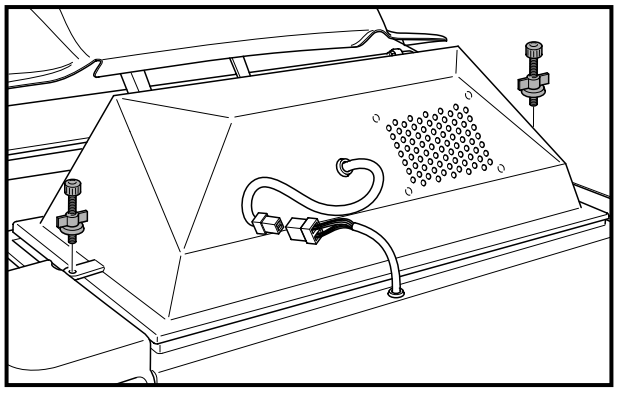
Remove the cover.

Disconnect the electric cable of the filter-shaker motor and suction fan (the machine must first be turned off and the key out).

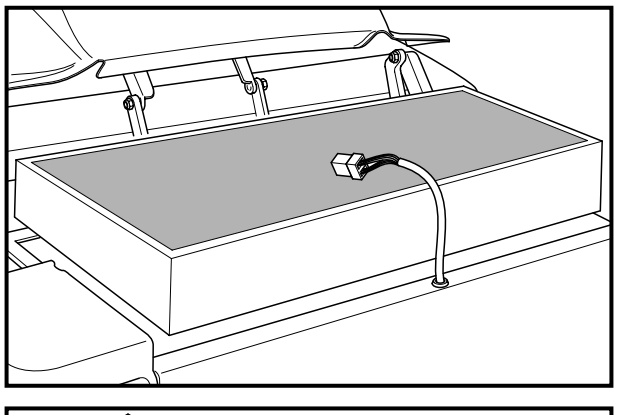


Loosen the locking nuts on the two knobs and remove the knobs.

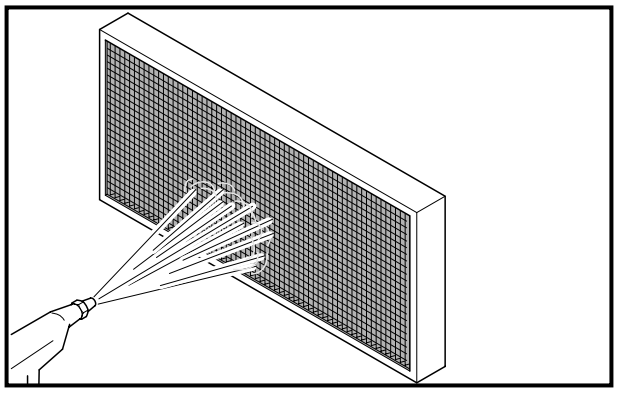
Remove the support of the suction fan.



Remove the the panel filter.



Clean the filter shaking it and blowing with compressed air - pressure not higher than 6 bar- from the side where the metal protection net is mounted, to prevent damage to the paper.



FILTER CLEANING AND REPLACEMENT

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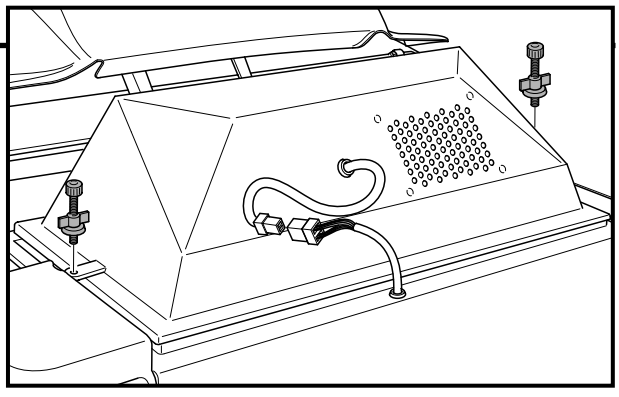


After cleaning fit the filter and the suction fan holder.

Tighten the two knobs and locking nuts and reconnect the electric cable..

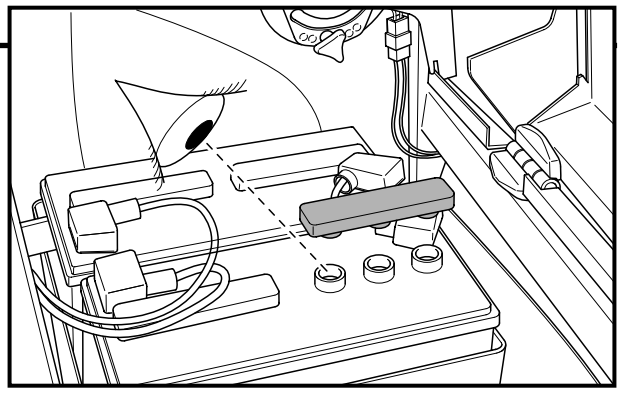
If the filter is damaged or can not be properly cleaned replace it with a new one.

Ask to your supplier for the new spare part.

Polyester washable filters are also available.

BATTERIES: CONTROL AND RECHARGE

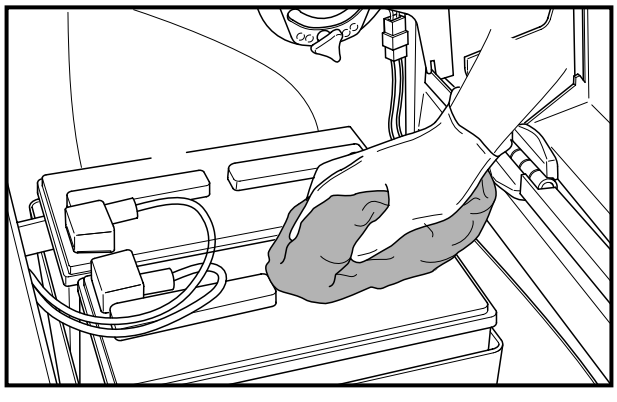
Make a frequent check of the electrolyte level inside every battery cell. The battery compartment is under the operator seat; lift the lid and open the caps of all the battery cells: when necessary fill up the cells with distilled water.



Warning: On the version with gasoline engine the battery level check must be done every week.

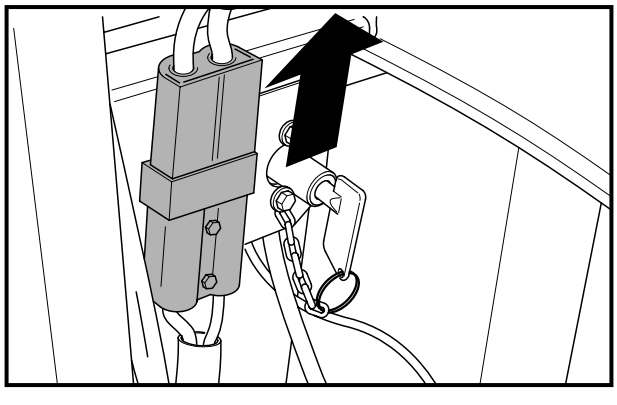
The proper electrolyte level is specified in the Manual for use and maintenance of the battery.

After filling close all the cell caps and clean the top of the battery from any acid remains.



Warning: the battery acid is corrosive; if it comes in contact with the skin or eyes rinse thoroughly with water and consult a physician.

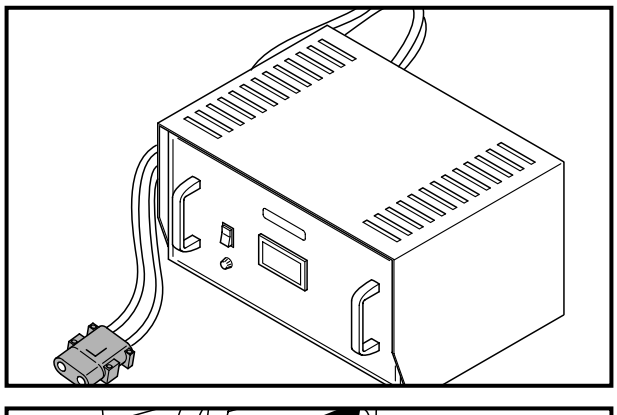
When necessary proceed with a recharge of the battery according to the following instructions and taking also into account what is specified in the Battery User Manual:



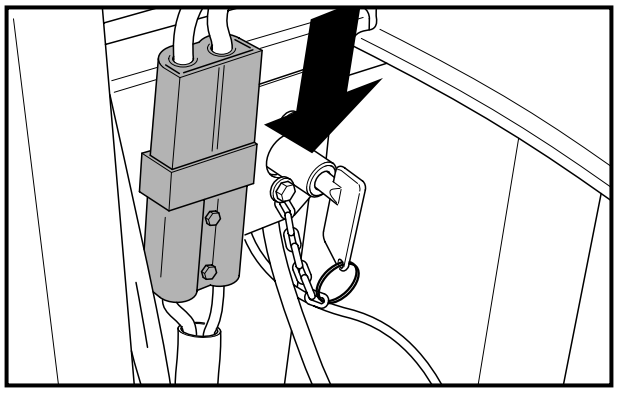
- switch the machine Off and remove the master key.

Warning: before starting the recharge the battery connector must be disconnected from the machine.

- the recharge must be done in a well ventilated area
- open all the cell caps
- connect the battery connector to the battery charger connector
- connect the battery charger cable to the mains (please check that the voltage and frequency of the mains correspond to the data of the charger)

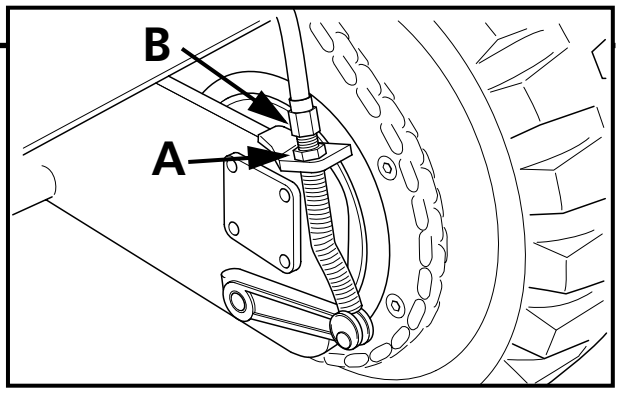


At the end of the recharge disconnect the battery from the charger and fit the battery connector to the machine. Close all the cell caps and clean the top of the battery from any acid remains.



BRAKES ADJUSTMENT

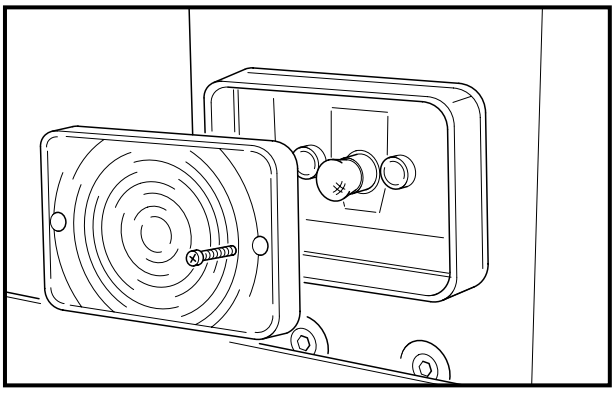
When the pedal brake and/or the parking brake reach a low efficiency operation some adjustments can be done: on the rear wheels
- loosen the locking nut **A**
- turn adjuster **B**
- tighten locking nut **A.**



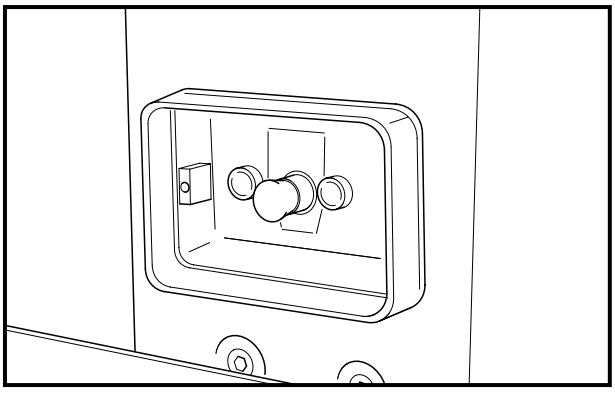
FRONT LAMP REPLACEMENT

In order to replace the front lamp:

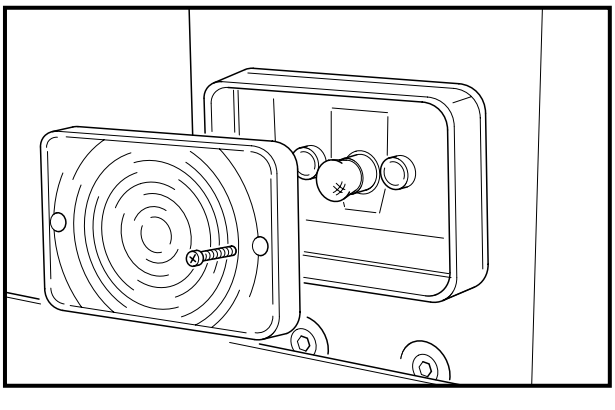
- remove the transparent cover



- replace the lamp paying attention to the volt and watt ratings



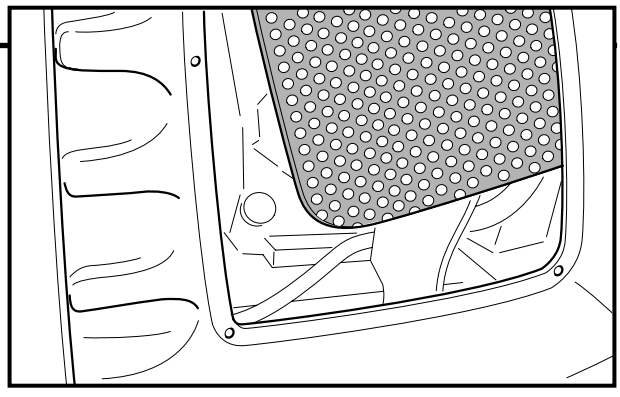
- fit the transparent cover.



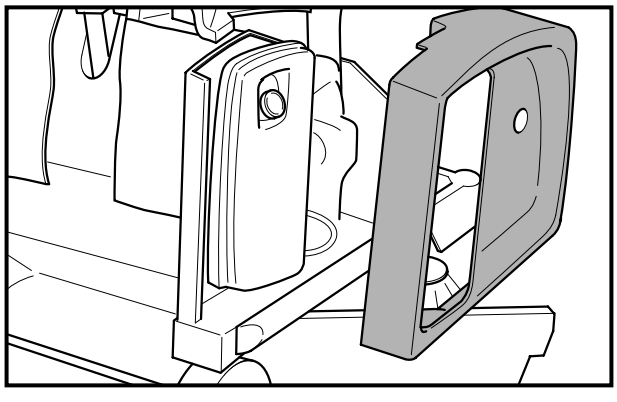
MAINTENANCE OF THE GASOLINE ENGINE

First: read thoroughly the Use and Maintenance Manual of the engine.
Here below some recommendations are pointed out.

Check the engine oil level twice per week. In order to check the engine oil level the right side panel (grate) must be removed, or simply slid up; save the five screws. For possible fill up read the oil type specified in the engine Manual.

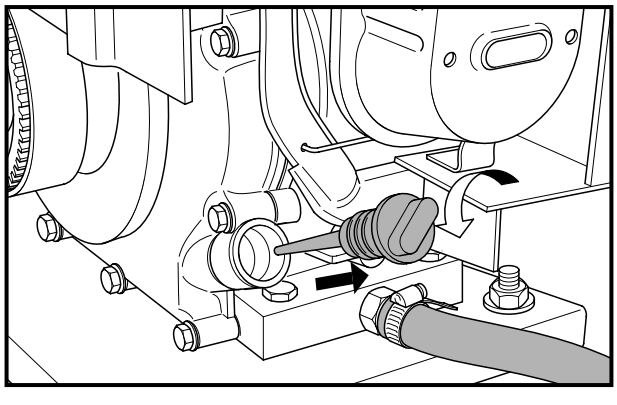


To replace the engine oil first the right side wall of the machine must be removed. In order to get access to the five screws fixing the right side wall lift the hopper and engage the hopper safety device: now you can get access to the two rear screws. Lift the bonnet to get access to the third screw. Open the right door of the main brush compartment to access the forth and fifth screws.



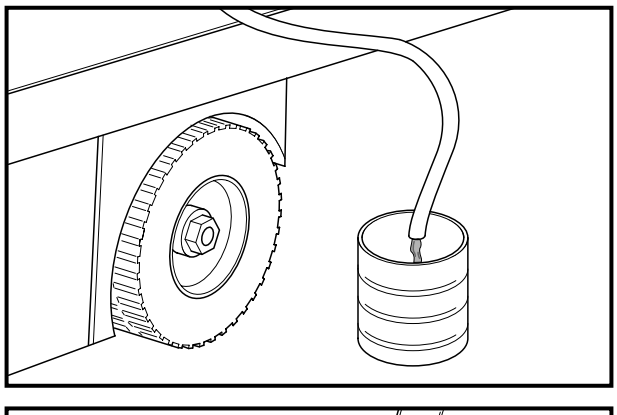
Warning: the engine oil must be replaced the first time after 50 working hours; the succeeding times it must be replaced every 100 hours.

NOTE: the engine is equipped with an oil safety device: this device does not allow the engine start – or will automatically stop the engine - in the event that the oil level be too low. No monitor (LED) is provided for this safety device.



Unscrew the oil level check rod and get access to the oil empting hose.

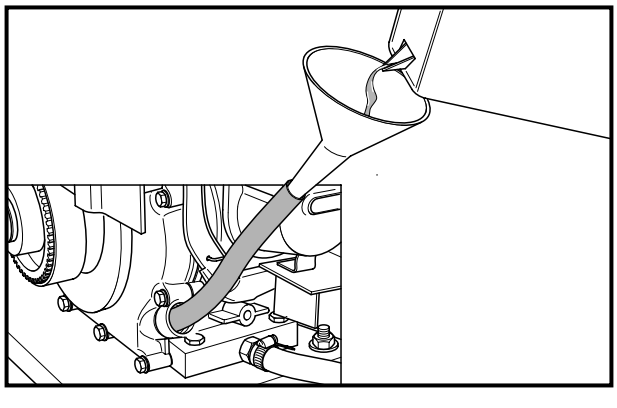
Remove the cap from the engine oil emptying hose and let the oil come out.



Note: it is suggested to remove the oil when the engine is warm.

Dispose of the used oil in proper special containers.

Note: keep the emptying hose lifted and open during filling.

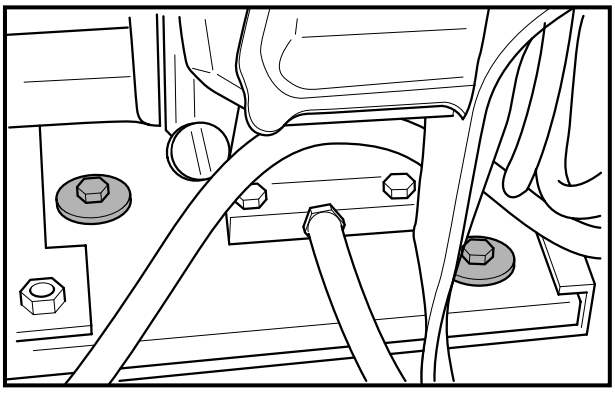


Take a funnel and a rubber hose and pour in the new oil from the hole of the rod for oil level check. Fit the rod for oil level check and close the emptying hose with its cap.

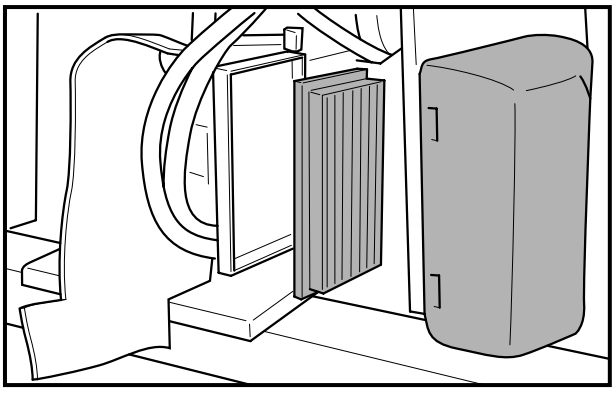
At the end of the filling sequence check the engine oil level.

Clean or replace the air filter according to the instructions of the engine Manual or whenever it is necessary.

In order to get access to the air filter the engine assembly must be slid out; to slide out the engine assembly first the right side wall of the machine must be removed (see engine oil replacement procedure for right side wall removal).



Then two screws must be loosened (17 mm wrench required) to allow to slide out the engine plate/ assembly



Now the engine air filter can be reached (save two screws).

SUMMARY OF MAINTENANCE CONTROLS (battery version)

Warning: the following interventions must be done with machine in Off condition and master key out. All the periodic maintenance operations must be performed by skilled personnel or by an authorized service centre.

Note: the battery life will depend on a good periodic maintenance (check of the level of the electrolyte and of battery voltage). Besides it must be taken into account that an unused battery is submitted to a self-discharge phenomenon. In the event that the machine is not used for a long time (e.g. 3 or 4 weeks) it is necessary TO RECHARGE THE BATTERY; infact the battery voltage MUST NEVER drop down below 20 Volt.

CONTROL	UPON DELIVERY	EVERY 30 HOURS	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 400 HOURS
Battery liquid level and voltage check	•	• OR EVERY TWO WEEKS			
Check the carbon brushes of all electrical motors and replace them if worn					•
Belt tension	•			•	
Brake adjustment	•			•	
Filter shaker			•		
Nut and screw tightness				•	
Wear of main brush and side brushes			•		
Panel filter cleaning			•		
Sealing of gaskets of filter compartment and of flaps	•		•		
GREASE: chain of the steering crown				•	

SUMMARY OF MAINTENANCE CONTROLS (gasoline version)

Warning: the following interventions must be done with machine in Off condition and master key out. All the periodic maintenance operations must be performed by skilled personnel or by an authorized service centre.

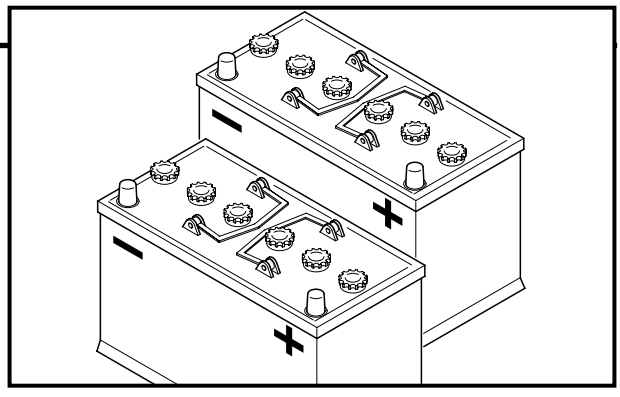
Every maintenance intervention on the gasoline engine must be performed in agreement with the engine User Manual.

Note: the battery life will depend on a good periodic maintenance (check of the level of the electrolyte and of battery voltage). Besides it must be taken into account that an unused battery is submitted to a self-discharge phenomenon. In the event that the machine is not used for a long time (e.g. 3 or 4 weeks) it is necessary TO RECHARGE THE BATTERY; infact the battery voltage MUST NEVER drop down below 20 Volt.

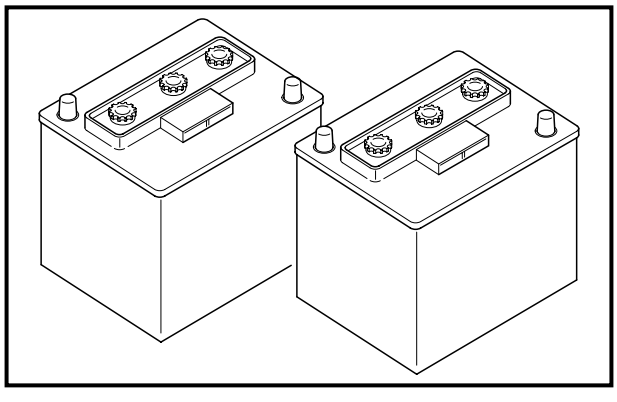
CONTROL	UPON DELIVERY	TWO TIMES PER WEEK	ONE TIME PER WEEK	EVERY 50 HOURS	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 400 HOURS
Battery liquid level and voltage check	•		•				
Engine air filter cleaning				•			
Panel filter cleaning					•		
Engine oil level check	1st TIME	•					
Engine oil replacement				• 1st TIME		•	
Engine RPM check adjustment*						•	
Check the carbon brushes of all electrical motors and replace them if worn							•
Belt tension	•					•	
Brake adjustment	•					•	
Filter shaker					•		
Nut and screw tightness						•	
Wear of main brush and side brushes					•		
Sealing of gaskets of filter compartment and of flaps	•				•		
GREASE: chain of the steering crown						•	

*3350 engine shaft RPM with no function working and battery voltage at about 24,5 Volt

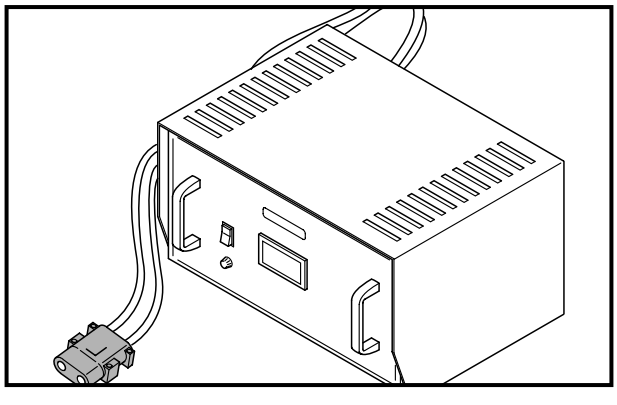
High capacity batteries for machine with gasoline engine



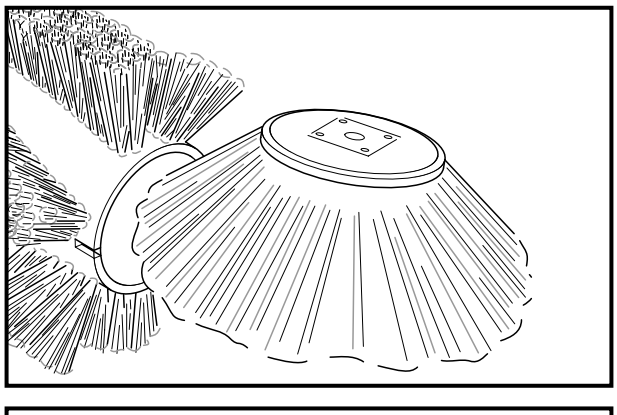
High capacity batteries for machine without gasoline engine



Battery charger

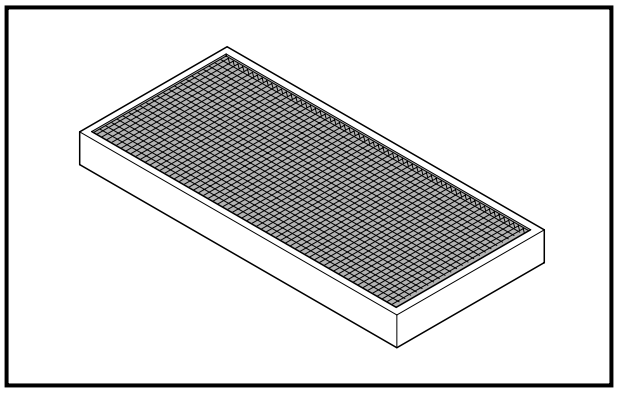


Different types of main bushes and side brushes



Polyester panel filter (it can be washed)

In order to have more detailed information for all the optional items get in touch with your supplier of the machine.



SAFETY FUNCTIONS AND TROUBLE-SHOOTING

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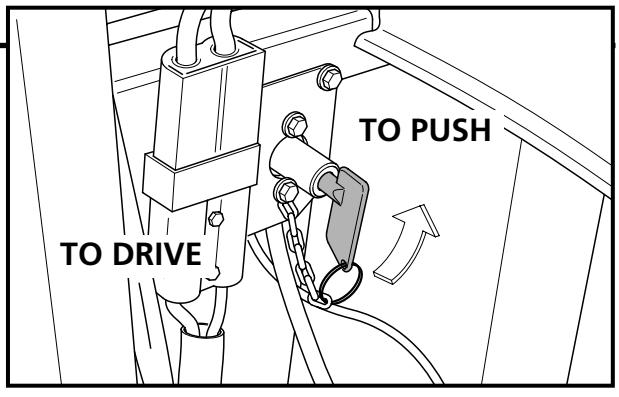
The machine is equipped with many safety devices and functions which have been described in the USE paragraphs (both for gasoline and electrical versions). For instance the automatic stop of all functions to avoid the deep discharge of the battery has been mentioned; and also the availability of a special red key for the disengagement of the self-breaking function has been notified: this is to be operated when the machine must be pushed in Off condition.

Besides the intervention of other safety functions is notified by means of dedicated safety codes appearing on the display. These safety codes are described in the following table.



SAFETY CODE 333

SAFETY CODE	MACHINE BEHAVIOUR	DESCRIPTION OF THE MALFUNCTION	POSSIBLE INTERVENTION
205	Stop of all functions except traction	The battery is fully discharged	- Proced with a recharge of the battery (see maintenance)
301	Stop of all functions and traction	Overtemperature of the drive motor	-If the machine run on a long ramp it could be normal: let the machine cooling 20 minutes -Check the efficiency of the front and rear brakes -Check the rotation of the rear drive wheels
302	The machine does not start or, in the event it was working, will stop	Possible problem with traction control electronic circuit or fuse	-Turn the machine off and wait 5 seconds -Turn the machine on -If code 302 will remain call service
305	The machine functions will stop	High temperature on the electronic control circuits (95 °C)	-If the ambient temperature is high let the machine cool down 20 minutes -If the problem will remain call the technical service to check the electrical motors
306	Stop of all functions and traction	High temperature on the electronic control circuits (105 °C)	-Make the same checks as per code 305
307	The machine does not start	Wrong start sequence	-Release the accelerator pedal before turning the key On
308	The machine does not start	Damage of the cable of potentiometer for traction control	-Check the cable connections of the potentiometer for traction control -Check the potentiometer for traction control
333	The machine does not start	-Off status of the red key for the disabling of the self braking function **(see the picture on the top page)** -Possible trouble of motor kables (short circuit or open circuit)	-Turn the machine off -Insert the red key and turn it clockwise -Check the drive motor cables
800	Display flashing	Main brush worn	-Replace the main brush

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Nilfisk-Advance, Inc.
14600 21st Avenue North
Plymouth, MN, 55447-3408
www.nilfisk-advance.com
Phone: 800-989-2235
Fax: 800-989-6566

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